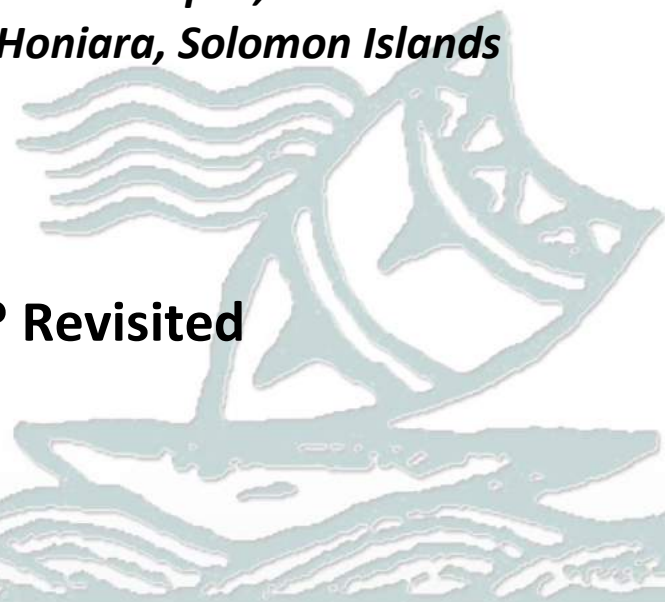


Proceedings of the Vaka Pasifiki Education Conference 2016

*5 & 6 September 2016, Kukum Campus,
Solomon Islands National University, Honiara, Solomon Islands*

Education for What? Revisited



Editors | Ruth Toumu‘a, Mo‘ale ‘Otunuku
Institute of Education, USP
VOLUME 2

March 2017

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Editors

Ruth Toumu'a, PhD

Mo 'ale 'Otunuku, PhD

INSTITUTE OF EDUCATION

THE UNIVERSITY OF THE SOUTH PACIFIC

Vaka Pasifiki Education Conference

Education for What? Revisited



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Acknowledgements

The Conveners and Working Committee of the Vaka Pasifiki Education Conference 2016 would like to acknowledge the generous sponsorship of:

- Ministry of Education, Human Resources and Development – Solomon Islands
- Our Telekom
- Solomon Power
- Melanesian Holdings Ltd
- Central Bank of Solomon Islands
- RICOH
- National Reserve Bank of Tonga
- Advanced Technologies Ltd
- Pure Fiji
- FMF
- Szeba
- Kokonut Pacific Solomon Islands
- Pasifiki
- The University of the South Pacific
- Solomon Islands National University
- The Victoria University of Wellington

IOE, on behalf of Solomon Islands National University and The Victoria University of Wellington, sincerely thank all Vaka Pasifiki Education Conference delegates and presenters. In particular the presenters, who have freely shared their insights and wisdom with us all, and made the Conference a time of rich learning.

IOE wishes to thank the abstract review panel. Our sincere thanks also to Laura van Peer, for her significant editing and proofreading support and generosity with her time and expertise in supporting the editors.

The Conveners and Working Committee also wish to sincerely thank the Director, staff and volunteer students of Solomon Islands National University and all other institutions whose staff and students provided enthusiastic logistical support.

On behalf of the Conference delegates we thank the Conveners for their outstanding leadership, and warmly thank the Conference Working Committee, led by Dr Mo‘ale ‘Otunuku of IOE.

To all who made the Vaka Pasifiki Education Conference 2016 a success – thank you.



Foreword by the Conference Conveners

Dear fellow Vaka Pasifiki voyagers, it is our pleasure once again to present the Conference Proceedings of the VAKA PASIFIKI EDUCATION CONFERENCE held at the Kukum Campus of the Solomon Islands National University (SINU), in Honiara, Solomon Islands on the 5-6 July 2016. The Conference theme was “Education for what? Revisited”, and recognizes the importance of revisiting the ‘old’ questions when re-thinking current ones, and contemplating educational futures in Oceania.

The 2016 Conference streams demonstrated a fresh approach to streaming educational thought. The streams were: (1) *Stop Doing* (presentations primarily concerned with advocacy and making a change-oriented point, advocating a particular perspective for change based on either or both research and practical lived experience); (2) *Keep Doing* (presentations designed to showcase and share current best practice and evidence of what is working well, for the purpose of inspiration, dissemination, and encouragement); *Start Doing* (presentations relating to cutting edge research, innovation, the presentation of critique of theory or practice, leading to new understandings and clarity). These streams gave rise to the expression of innovation, good practice, and learnings from practitioners to guide and motivate their fellow Vaka voyagers in their educational journeys.

This year’s conference saw a number of new records established. A total of 93 papers were presented to 410 delegates, 90% of whom were national participants. This represents an unprecedented opportunity for Solomon Islands educators to come together for an outstanding learning and sharing experience: an opportunity made possible by the generous monetary and in-kind sponsorship of a number of local and regional sponsoring companies and institutions, and the tireless efforts of more than 50 volunteers and staff teams from University of the South Pacific (Solomon Islands Campus), SINU, and The Victoria University of Wellington (VUW).

This is the third Vaka Pasifiki Education Conference, following conferences in Suva, Fiji in December 2011, then in Nuku’alofa, Kingdom of Tonga in July 2014. The first conference marked a decade of re-thinking Pacific education through the Re-thinking Pacific Education Initiative for and by Pacific Peoples (RPEIPP). These conferences have not only provided vital opportunities for intellectually stimulating, collective thinking about education by and for Pacific peoples, they have also resulted in the output of valuable edited books comprising selected papers from the conferences.

The Vaka Pasifiki itself is an educational movement which deliberately nurtures an emerging indigenous Pacific research school of thought. The movement can be understood through the richly metaphoric concept of the vaka, the ocean-going sail boats and canoes of island-dwelling Pacific peoples.

The 2016 Conference was hosted by the University of the South Pacific’s Institute of Education (IOE), SINU, and VUW. The USP-IOE is one of a number of institutes established by USP. IOE’s mandate is to assist Pacific nations in achieving quality education by providing them with high quality, relevant research, professional learning, and evidence-based, innovative advice and publications.

SINU merged existing training institutions and the former Solomon Islands College of Higher Education under one administration forming the national university which comprises five schools: Schools of Technology and Maritime Studies, Nursing and Applied Health Sciences, Natural Resources and Applied Sciences, Business and Management, and Education and Humanities. It was SINU's School of Education and Humanities which was heavily involved in organizing the 2016 Conference. VUW has been sponsoring and co-hosting the Conference series from the beginning and a number of its staff and graduate students regularly participate in organization, presenting, and attending the conference.

This Vaka Pasifiki Education Conference series has been outstanding in engaging the local community, and this was particularly witnessed during the Solomon Islands Conference. The Ministry of Education, Human Resources and Development, local communities, local businesses, school communities, and educators all came together to support the Conference. True to the Vaka Pasifiki vision and ethos, the Conference is characterized by the successful collaboration of diverse stakeholders and local communities, and by its democratic and inclusive nature. The Conference nurtures new academics and graduate students as well as providing a platform for experienced and distinguished scholars, leaders, and educators.

It has been our pleasure to convene this Conference, and we wish you stimulating and enjoyable reading of the papers presented in this Proceedings as a record of a selection of the insights shared at the Conference this year. We invite you to make contact with authors and continue productive conversations, and to start getting ready for VAKA PASIFIKI EDUCATION CONFERENCE 2018!

Your 2016 Vaka Pasifiki Education Conference Conveners,

Assoc Prof Kabini Sanga
Dr Seu'ula Johansson-Fua
Professor Basil Marasinghe





Vaka Pasifiki

Stop Doing...

Stream 1

Students' Attitude toward Learning Chemistry

Andrew I. Misitom, *Solomon Islands National University, Solomon Islands*

Abstract

In this present age, the world of education faces tremendous challenges including students losing interest in subjects such as Chemistry. There are many factors that have contributed to this observation. One of the factors is the students' attitude towards learning. This paper reports on a study conducted with year 10 Chemistry students in Solomon Islands. The results of this study reveal that a majority of the students have a negative attitude towards learning Chemistry. Students prefer conducting Chemistry experiments in the laboratory. The study findings have revealed, however, that student attitude and motivation towards learning Chemistry can be changed with continual encouragement by parents and peers, combined with effective planning of teaching and learning strategies.

Keywords: attitude, Chemistry, high school students, environmental challenges.

Introduction

Literature has suggested that students' attitude is determined by their desire to achieve (Bramaje & Espinosa, 2013; Hong & Lin, 2011; Reid, 2007). Some authors argue that it is achievement that determines students' attitudes, and that values toward science are important outcomes in science education (George & Kaplan, 1998; Hassan, 2008; Jovanovic & King, 1998; Kan, & Akbaş, 2006; Osborne & Collins, 2000). Values related to science have a clearly recognisable influence on participation in the study of science and in the choice of career. In the same way, students' attitudes also influence both achievement and participation in science (George & Kaplan, 1998; Kan, & Akbaş, 2006; Keeves & Alagumalai, 1998; Zain, Rohandi, & Jusoh, 2010).

Purpose of the study

Over my years of teaching general science and Chemistry in Solomon Islands, I have noticed that the motivation of students to pursue further studies in Chemistry declines as they move through the formal education system. My suspicion is that this is due to fear of failing. Thus, I was interested in gathering information about the students' attitudes toward learning Chemistry that could be used to help educators understand the nature of learners in Chemistry learning environments. The intention was to provide insights into ways of teaching Chemistry that will positively change students' attitudes toward learning Chemistry. This study is significant because the area of science education research is new in third world countries such as Solomon Islands and neighbouring Pacific Island Nations.

Study questions

The purpose of the study was to answer the two major questions:

1. What are student attitudes toward learning Chemistry?
2. What association, if any, is there between student attitude and motivation toward learning Chemistry?

Methodology

Study Population

The study population consisted of eight (8) classes of Year 10 students in four schools, which totalled 256 learners. The sample was chosen from the accessible population of Honiara secondary schools, and limited to the 2011 academic year.

Study Instruments

A mixed method research approach was used, involving a survey questionnaire comprising 10 items, and semi-structured focus group interviews. The quantitative (survey) and qualitative (focus group interview) data obtained were analysed with the intention to obtain an in-depth interpretation of patterns.

Analysis and findings

Three basic data analysis techniques were used:

1. Cross Tabulation of the quantitative data
2. Analysis of Variance (ANOVA) to check the validity and reliability of the study results;
and
3. Focus group – thematic analysis.

Cross tabulation

The nominal data, the topics, were placed in rows, and the ordinal data (the 5-point Likert scale) in columns (see Table 1). To discover the students' rating of their attitude toward learning Chemistry, the data on each scale/item were cross tabulated with other students' responses as per their 5-point Likert scale ratings. From the table, the mean of students' rating for each of the items was then calculated, with their standard deviation

Table 1: Student Attitude toward Learning

Analysis of Variance (ANOVA)
ATTITUDE TOWARD LEARNING CHEMISTRY

(N_{total} = 258)

RATING SCALE + STUDENT RESPONSES

ITEM	SCALES	SA	A	NA	D	SD	Tot.	MEAN	STDEV
		1	2	3	4	5	n		
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)		
1	Looking forward to Chemistry lessons	81	106	45	17	9	258	2.10	0.26
		31	41	17	7	3	100		
2	Chemistry lessons are fun	42	74	78	44	20	258	2.71	0.28
		16	29	30	17	8	100		
3	I enjoy the activities we do in Chemistry	77	119	42	13	7	258	2.05	0.32
		30	46	16	5	3	100		
4	The Chemistry we do includes the most interesting things at school	44	95	86	22	11	258	2.46	0.36
		17	37	33	9	4	100		
5	I want to find out more about the world we live in	145	94	13	6	0	258	1.53	0.32
		56	36	5	2	0	100		
6	Finding out about new things is important	184	66	2	6	0	258	1.34	0.32
		71	26	1	2	0	100		
7	I enjoy Chemistry lessons in this class	55	114	55	22	12	258	2.31	0.29
		21	44	21	9	5	100		
8	Love talking to my friends about what we do in Chemistry	60	116	52	26	4	258	2.22	0.32
		23	45	20	10	2	100		
9	We should have more Chemistry lessons each week	73	89	62	26	8	258	2.25	0.25
		28	34	24	10	3	100		
10	I feel satisfied after a Chemistry lesson each week	37	104	73	29	15	258	2.54	0.31
		14	40	28	11	6	100		
Average Mean & STDEV values							2.15	0.30	

Key:

SA=Strongly Agree, **A**=Agree, **NAD**=Neither Agree nor Disagree, **D**=Disagree, **SD**=Strongly Disagree, **STDEV**=Standard Deviation (Misitom, 2012).

The purpose of ANOVA analysis is to test for statistically significant differences between means. The mean is an informative measure of the central tendency of the variables by which the “true” (population) mean is located with a given level of certainty (Cohen et al., 2007) (Tables 2 & 3). This is to ensure that there is confidence in inferring from the data collected and its implications for the entire population of Year 10 students in the Solomon Islands and in similar Pacific contexts as well.

Table 2 shows the Cronbach’s Alpha is 0.99, indicating that the questionnaire used was reliable.

Table 2: Reliability Summary Data (Cronbach's Alpha for the Student Attitude toward Learning Chemistry, n=258)

Scale Name	No. Of Items	Reliability Statistics *Cronbach's Alpha
Attitude Toward Chemistry	10	0.99

*Cronbach's Alpha – coefficient of reliability, a measure of the internal consistency or reliability of the questionnaire used in the study.

Table 3 presents the scale mean and standard deviation data for the questionnaire used in this research.

Table 3: Scale Means and Standard Deviations Data for (Student Attitudes toward Learning Chemistry, n=258)

Scale Name	No. of Items	Scale Statistics			*Grand Mean
		Mean	Variance	STDEV	
Attitude Toward Chemistry	10	21.51	83.46	9.14	2.15

* Grand Mean – is the average mean for each of the scales respectively (Misitom, 2012).

Thematic Analysis

Data collected from the interviews were analysed by generating meaning from spoken and transcribed data. This was done by counting the frequency of occurrence of ideas, words, and pieces of data, and categorizing them into themes (see Table 4).

Table 4: Summary of Findings of Student Attitude toward Learning Chemistry

Themes	Concepts (Question no)	Description	Comments
1. Student Attitude Toward Chemistry Lessons	A. Attitude toward Chemistry lessons (15,16,17,18,23, 24)	Extent to which students feel for their Chemistry lessons	<ul style="list-style-type: none"> Student attitude is shaped by the nature of teaching and learning strategies employed, lesson timing, Chemistry topics and their relevance to life.
2. Student Attitude and Practical Work	A. Attitude toward Chemistry practical work (21, 22)	Extent to which students value the importance of practical work in Chemistry	<ul style="list-style-type: none"> For better retention of Chemistry content knowledge, practical skills and attitude, active learning involving investigation and practical work is essential.
3. Student Attitude and Chemistry Learning	A. Attitude toward learning Chemistry (19,20)	Extent to which students' curiosity drives them to want to know more.	<ul style="list-style-type: none"> Attitude towards studying Chemistry depends on students' feeling for the subject and their choice of future career pathways.

Discussion

Research on student attitude suggests that prior beliefs can change with new information presented within students' current beliefs, attitude, and experiences (Areepattamannil et al.,

2011; Bandura & Locke, 2003; Bannier, 2010; Britner, 2008; Dalgety, 2003; Reid, 2007). The study findings here highlight that to change an individual's attitude, the teaching of Chemistry must be seen by students as worthwhile, and related to the individual's own beliefs and attitudes.

Student attitudes toward learning Chemistry

Similarly to other studies conducted to measure attitude (Dalgety, 2003; McGurie, 1989; Riffat Un, et al., 2011), the results here reveal that attitude is either a result of direct experience or observational learning from the environment. Firstly, the survey reveals while the students value the acquisition of a holistic understanding of Chemistry for life, their attitude towards it is negative. The resentment shown here by students seems to have its origin in students' past learning experiences of Chemistry. For instance, most Chemistry classes are taught without practical work. In some schools the lack of laboratory work was due to a lack of proper laboratories, and not enough scientific apparatus and reagents. For schools with these resources, a lack of effective planning by teachers is a major factor. This is consistent with findings reported in previous studies in the Solomon Islands (Giano, 2010; Kakai, 2010).

Secondly, students' attitudes toward Chemistry can be stimulated by how the Chemistry lessons are presented. The willingness of students to participate in the learning process lies in the ways teachers conduct themselves in class, their choice of teaching and learning strategies, and the learning environment. This is consistent with previous studies (e.g., Hong, 2010; Reid, 2007; Sesen & Tarhan, 2010; Zain, Rohandi, & Jusoh, 2010) investigating general attitudes toward science. Reid (2007) states that learning outcomes are subject to affective variables as much as they are to cognitive variables. Interestingly, the participants here expressed a desire to have fun in their Chemistry lessons, which in turn might encourage involvement and result in a positive attitude toward learning Chemistry.

Thirdly, parents have a pivotal role in influencing students' attitudes toward learning Chemistry. The majority of students in this study expressed that their parents were supportive of their study of Chemistry. This contrasts with some research which suggests that the home background is unrelated to student attitude (e.g., Schibeci, 1989). Some students have positive attitudes toward learning Chemistry because their parents are science graduates who encouraged them to study Chemistry. The help rendered by parents to their children, in their Chemistry homework and promotion of Chemistry-related activities at home, is influential on students' attitude toward learning Chemistry. This is consistent with other studies (e.g., Jones et al., 1996; Jarvis & Pell, 2002). However, unlike the findings of these studies, students in the Solomon Islands are more likely to be influenced by parental opinion, regardless of gender. This is attributed to the respect that such a society has for parents and the elderly generally.

Finally, peers strongly influence student attitudes toward learning Chemistry. This also differs from other research which suggests a tenuous relationship between peer attitude and student attitude (e.g., Dalgety 2003). Participants in this study revealed that positive influence by high achieving peers had impacted their attitude toward learning Chemistry: students form peer groupings within their year level that reinforce their interest and encourage them to achieve higher grades in Chemistry. This is also consistent with other research findings (e.g., Cheung, 2009; Gogolin & Swartz, 1992; Talton & Simpson, 1985) that such collaboration results in changing students' attitudes toward learning Chemistry.

Student attitude and motivation

Qualitative data were used to see whether students identified a relationship between motivation and attitudes toward learning Chemistry.

The findings highlight that there is a direct cyclical relationship between students' motivation and their attitudes toward learning Chemistry. Students' curiosity and desire to achieve motivates them to have a positive attitude toward learning Chemistry. This helps students set higher, achievable goals. Achieving such goals encourages students by creating a desire to know more about the subject. Such findings are consistent with the literature (e.g., George & Kaplan, 1998; Hardre, Sullivan & Crowson, 2009; Hong, 2010; Reid, 2007). In addition, students are motivated when they see the worth of knowledge of Chemistry, and as a result they are interested in studying it. This is also consistent with other work (e.g., Pei-Hsuan, 2008; Reid, 2007; Tuan et al., 2005; Walker & Greene, 2009), in which the values related to science have clearly recognisable influence on both science achievement and participation and on career choice.

Implications of the study

The implications of this study are likely to be of interest to teachers, curriculum developers, and teacher educators, and it is expected that the findings will be of value in a number of ways.

Firstly, the findings can be used as a reference point to bridge the teaching and learning gap that exists between the Chemistry teaching and learning process, and to establish a better understanding of the Chemistry classroom environment. For instance, students' desire for effective practical work can be addressed by Chemistry teachers. Such practical work can be achieved by improvisation within the school surroundings, such as an outdoor laboratory. With careful planning, implementation, and increase in the frequency of such practical tasks, worthwhile learning can take place, thereby bridging the Chemistry contextual teaching and learning gap.

Secondly, the findings could also act as a reference point for developers of Chemistry curriculum, helping them reflect on the curriculum design at each year level to ensure that contextualised Chemistry learning is taking place. The Chemistry curriculum envisioned is one that incorporates common contextual daily experiences – involving chemical principles and concepts – into the teaching and learning of Chemistry. These should be designed into improvised contextualised learning experiences and experiments within the Natural and Processed Materials (NPM) strand of the Solomon Islands National Science Curriculum (SINSC) and similar. The intention is to ensure that such conceptual learning and experimental work is done by Chemistry students throughout the entire country, even in remote locations with minimum resources.

Thirdly, for teacher educators, this is a worthy resource for reflection upon how teachers of Chemistry should be trained to address teacher and student behaviour that is deemed unsuitable for encouraging learning in Chemistry classrooms. The study instrument can be used to evaluate the impact the current Solomon Islands National Curriculum and similar curriculums have on student attitudes toward learning Chemistry. In addition, the School of Education and Humanities (SOEH) at Solomon Islands National University (SINU), and

similar training institutions offering science teacher educator programmes, could develop and strengthen an improvised contextualised module which would engage and equip science teachers with the skills and knowledge required to effectively teach Chemistry. Such programmes could be reviewed based on the administration of SINS. Furthermore, a policy should be developed which stipulates clearly the minimum Chemistry teacher skill entry requirement prior to entering the teaching profession. Such a benchmark could ensure teachers of Chemistry are equipped with the ability to teach contextual Chemistry, in remote school settings, to a certain level. This notion can be extended to include other science subjects such as Biology, Physics, and the Earth Sciences.

It is anticipated that the findings in this paper will create interest into further research on student attitudes toward learning Chemistry. This research is unique because it is the first of its kind conducted within the context of Solomon Islands, and it prompts teachers of Chemistry to reflect and to take stock of their teaching. Its findings may also help in finding ways to improve teaching and learning weaknesses. It is essential that teachers of Chemistry communicate the knowledge within the field effectively and adapt to changes to the learning needs of students. As is identified by the research findings, by implementing changes that foster effective and worthwhile learning of Chemistry within the classroom, Chemistry students' attitudes can improve which, in turn, should boost student ability and further improve performance.

Conclusion

The study findings have revealed that while students value a holistic understanding of Chemistry for life, there is a negative sentiment expressed by some students. This is reportedly due to the lack of practical work done by students as well as ineffective planning of Chemistry classes. It was, however, discovered that student attitudes towards learning Chemistry can be changed by effective teacher-pupil interpersonal relationships. Student attitude can also be changed by the implementation of effective teaching and learning strategies and in creating an environment conducive to learning. In addition parents and peers play very important motivating roles in changing student attitudes towards learning Chemistry. Motivated students, therefore, have a positive attitude towards learning Chemistry by setting higher achievable goals. As identified by the study, choosing to be positive and having an appreciative attitude determines how students can change their attitude toward learning Chemistry.

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Developing inclusive practices with Pacific secondary students and their families in Aoteroa/New Zealand

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Abstract

The senior years of schooling are critical for young people as they prepare for national, academic qualifications, and make decisions about their careers and further study. Research indicates that students can greatly benefit from the support of family members to guide and advise them through this period. However, research also tells us that Pacific parents are often unsure of the school system and may avoid interaction with teachers. Furthermore, research has identified that some Pacific students keep their worlds of home and school separate from one another. Consequently, parents may feel distanced from their child's learning and opportunities to play a supportive role may be lost. The challenge for schools, therefore, is to find ways to interact with Pacific families so parents can feel more fully informed and better able to support their child's academic progress.

This paper presents a review of literature, undertaken as part of a doctoral study, which explores the intersection between the values embedded within school systems and the values of Pacific families. Whilst it acknowledges the diversity of cultures and identities encapsulated in the generic term "Pacific", its purpose is to consider what tensions may exist between the worlds of home and of school which prevent some families from being more engaged with the learning process.

Through an exploration of the perceptions of teachers, students, and their families relating to home-school interactions, this review recognises that further research would be beneficial. It also includes personal reflection in which I consider my European background and re-think my position as a researcher with Pacific people.

Introduction

This paper explores how schools can develop inclusive relationships with families in order to support academic achievement for Pacific secondary students in Aotearoa/New Zealand (NZ). It also describes a personal journey. With a European background, I am learning to navigate Pacific waters. Having completed a Master's degree, investigating Pacific perceptions of parents' role in a NZ high school, my doctoral study considers how NZ secondary schools can work with Pacific families for the betterment of students' learning. As I embark on this new phase of research, I too need to rethink my position as a researcher in Pacific education.

The paper begins with a background context explaining both the relevance of this topic and the starting point in my thinking as I step into doctoral research. It then presents the perspectives of those involved in home-school interaction – Pacific students, Pacific parents (or caregivers), and teachers. The purpose is to explore the intersection between the values of Pacific families and those embedded within the school system, and reveal tensions between the home and the school that may prevent some families' engagement in the learning process. The paper concludes with some self-reflection. If my research is to be of service to the Pacific community, how am I to approach a topic which explores the nature of relationships

between Pacific families and school? What re-thinking must I embrace if I want to achieve successful outcomes in my study?

Background

The Pacific population in NZ is diverse, dynamic, and evolving, with over 60% born in NZ, and growing at three times the rate of the overall population (Ministry of Pacific Island Affairs, 2015). Given concerning statistical data about achievement, such as Pacific young people (along with Māori) being the least likely of all ethnicities to go to university (Madjar, et al., 2010), government agencies have developed goals and strategies to improve educational outcomes for this cohort (Ministry of Education, 2012; Ministry of Pacific Island Affairs, 2015), including the development of inclusive practices with Pacific students and their families. This reflects a change in thinking. In the past, Pacific students and their families have been viewed through a “monocultural lens” and seen to be failing in the way they engaged with the dominant values within the New Zealand system (Gorinski & Fraser, 2006). Currently the emphasis is more on how schools could be more culturally inclusive so as to better meet the needs of these families (Tuafuti & McCaffery, 2005). The Education Review Office (which reviews educational practice in schools) makes links between positive home-school relationships with Pacific families and academic achievement (ERO, 2013); and government policy now specifically promotes the closer engagement of schools with Pacific families and the community to support students’ learning (Ministry of Education, 2012; Ministry of Pacific Island Affairs, 2015). This change of direction fits well with the growing aspirations of the Pacific people in New Zealand (Bennett, Brunton, et al., 2013.). Consultation with the Pacific community is key (Airini, Anae, et al., 2010) so that Pacific people can contribute to Pacific success. The younger generation, given the right opportunities, *can* make a positive impact on the future of the New Zealand economy (Ministry of Pacific Island Affairs, 2015).

Home-school relationships

The focus on schools and families working together in order to support achievement is supported by findings in research literature and is relevant for all years of schooling, regardless of socioeconomic or ethnic background (see Biddulph, et al., 2003; Bull et al., 2008; Catsambis, 2001; Desforges & Abouchar, 2003; Harris & Goodall, 2007; Jeynes, 2007). However, the complexity of multiple subjects and teachers make home-secondary school connections tricky, and secondary students may not wish to involve families since they are adolescents who probably value autonomy (Hill & Tyson, 2009). Nevertheless, families can play an important role in the senior years of schooling. They can positively influence their children’s learning by acting in an advisory capacity, supporting with matters such as learning strategies, course options, and career choices (Hill & Tyson, 2009) which they do best when well informed (Catsambis, 2001).

Home-school interaction is easier when the values of the school and those of the home are closely aligned (Harris, 2013; Taleni, et al., 2007). Such families have a distinct advantage in accessing educational opportunities (Bourdieu, 2011). Pacific families, in gaining access to the education system in NZ, are required to familiarise themselves with Western values and beliefs; yet, the worldviews which influenced them to come to New Zealand may reflect quite different ideas (Samu, 2010). Although teachers can help create bridges between these two worlds (Nicholas, et al., 2013), power dynamics play a part when the values of the school are prioritised over those of minority families (Cummins, 2009). A challenge for schools,

therefore, is how to engage such families so that they feel more empowered, and able to support their children's learning.

Pacific frameworks – *Teu Le Va* and *Talanoa*

Understanding the nature of reciprocal and inclusive relationships was part of my master's journey. *Teu le va* is a framework designed for Pacific research, based on the pan-Pacific concept of *va*, which helps to illuminate how relationships should unfold in a respectful and meaningful way (Airini et al., 2010; Anae, 2010). Literally translated as "tidy up the space", *teu le va* indicates that for good outcomes, the space or relationship between individuals must be valued and nurtured. Samoan in origin, it encapsulates the importance Pacific people place on operating in an interdependent, relational way. The *teu le va* framework helped me to understand that I needed to pay attention to relationships if my research was to have a successful outcome.

I conducted interviews and focus groups using the principles of *Talanoa*, a Pacific research methodology now widely used, particularly in education (Farrelly & Nabobo-Baba, 2014). Meaningful interaction with participants occurs in face-to-face situations where there is fluidity in the direction of conversation; when conversation runs freely, there is room for relationship-building which then leads to collaborative discussion and constructive solutions (Vaiolleti, 2006, 2014). If the researcher attempts to overly control how the interaction unfolds, participants may withhold information or only say what is expected of them. In adopting a *talanoa* approach, there is a conscious and explicit decision on the part of the researcher to build relationships with participants so that feelings can be openly shared. This helps construct rich data and is, therefore, deemed to be a positive aspect of the research process (Vaiolleti, 2006).

Learning about the principles of *teu le va* and *talanoa* was immensely helpful to me as a European involved in Pacific research. I trusted in the processes and felt it led to meaningful relationships and the co-construction of knowledge with participants. Subsequently, after listening to the presentation of my research findings the principal commented on appreciation of the significance of relationships for Pacific families. Thus, through lessons learnt from Pacific frameworks, I was pleased to be able to convey an important message to the school.

Perspectives

My doctoral journey has, therefore, been influenced by the realisation that trusting and collaborative relationships are key to successful home-school interaction with Pacific families. An evaluation of literature on the perspectives of Pacific students, their families, and teachers has revealed, however, some tensions that may impact negatively on home-school relationships.

Students' perspectives

During secondary schooling, students often find themselves in the position of mediator between home and school as parents become less directly involved (Desforges & Abouchaar, 2003). Research literature, capturing Pacific student voices over time and in different contexts (low and high decile schools for instance), suggests these students steer away from the mediating role, preferring to keep their worlds of home, school, and church separate (Flavell, 2014; Hawk & Hill, 1996,1998; Siope, 2011). Flavell (2014) found that, fearful of

not meeting the high expectations of their parents, students chose to say as little as possible about their school performance. Thus parents continued to set high expectations, reinforcing students' reluctance to keep them informed about their progress. These studies suggest that the tension which adolescent students might typically feel about involving their parents has particular significance for some Pacific Island students. The passing of time and change of school setting does not seem to have made a difference.

Research has also gathered Pasifika students' perceptions about the influence of home and family on their learning and academic success (Benseman, et al., 2006; Flavell, 2014; Fletcher et al., 2008; McDonald & Lipine, 2011; Mila-Schaff & Robinson, 2009; Nakhid, 2003; Siope, 2011). In different contexts and over a number of years, these studies have confirmed the importance of family for young Pasifika people. Students acknowledge and value their parents' sacrifices, encouragement, and commitment to their education and appreciate a home environment that is conducive to study.

Others have reported parents' lack of understanding about their studies (Benson et al., 2006; Flavell, 2014; Madjar et al., 2010); the pressure of family duties and church commitments can impact negatively on their time, and the pressure at the same time to do well academically. Subsequently, some students have found it difficult to have honest conversations with their parents about their learning needs (Flavell, 2014). One factor which can contribute to students' academic success and access to university is the support of knowledgeable parents who can help set realistic goals and targets (Madjar et al., 2010), suggesting the benefit of schools working closely with families so parents are better informed about their children's academic progress and, therefore, better equipped to play a supportive role.

Parents' perspectives

Literature shows common ground between the perceptions of students and those of parents. Many families migrated to New Zealand for a better life, perceiving that education is an important tool for gaining economic prosperity for their children (Samu, 2010, Siope, 2011) with family remaining in the home countries, too, often benefitting financially from the prosperity achieved by those who migrated. Thus, education is highly valued and seen as important to meet the collective needs of the family. Consequently, parents are keen for their children to succeed academically (Gorinski & Fraser, 2006; Spiller, 2012), and they set high expectations (ERO, 2008; Flavell, 2014, 'Otunuku, 2011). In the light of high expectations, parents like to be kept informed of progress, receiving information and advice from the school so that they can provide support at home (Amituanai-Toloa, et al., 2009).

While parents may be interested in their children's education they are not always sure about their role (Fletcher, et al, 2009; Green & Kearney, 2011) or what their children are doing (Green & Kearney, 2011), particularly with senior assessments (Flavell, 2014; 'Otunuku, 2011), and they may not know how best to motivate them (Fletcher et al., 2009). Parent meetings are avoided for reasons such as long working hours, family and church commitments (Green & Kearney, 2011), or because parents are uncomfortable in the school environment due to language barriers and/or a cultural disconnect between the values of home and school which inhibit an exchange of ideas (Fletcher et al., 2009; Gorinski, 2005; Spiller, 2012; Tuafuti, 2010).

Even if parents do attend meetings, it does not necessarily lead to a conversation with mutual understanding. The challenge for schools, therefore, is to develop effective practices which involve Pacific parents in inclusive and trusting relationships where the parents feel able to express themselves.

Schools often design strategies intended to build such relationships between the parents and teachers; however, results can be disappointing (Harris, 2013). 'Otunuku (2011) argues for changes in attitudes by both schools and parents – parents could prioritise academic needs over church and family commitments, while schools could celebrate student achievement more overtly. Harris (2013) relates how the Christchurch earthquake brought the school and community together in a shared mission to support the children. The school played a central role in the welfare of the community, and a positive shift in relationships between teachers and parents continued after the immediate impact of the quake. This may have been a factor in improved academic results in 2011 – the year of the earthquake (Harris, 2013). This example suggests that when schools change their practices and perceptions regarding the engagement of Pacific families, then families may be willing to change their perspectives too.

Teachers' perspectives

Engagement with Pacific families and the community can happen as a result of initiatives by school leaders or individual teachers (Harris, 2013). However, some teachers lack appropriate cultural knowledge for this (Allen, Taleni, & Robertson, 2009) and may not realise how their cultural beliefs and assumptions influence the way they interact (Allen et al., 2009), including judgements based on Western values which may not align with those of other cultures (Bishop & Glynn, 1999). The research of Allen, Taleni, and Robertson (2009), where a transformation in relationships between teachers and Samoan families was possible when teachers developed a deeper cultural understanding through visiting Samoa, shows how professional development opportunities for teachers can enhance these relationships. However, as Nicholas and Fletcher (2015) indicate, there is very little professional development available to support teachers in their engagement with Pacific students and families. The risk, therefore, is that teachers make negative assumptions based on a lack of understanding. Recent studies illustrate this point. Studies by Spiller (2012), and Turner, Rubie-Davies and Webber (2015) clearly illustrate how, due to lack of cultural understanding, teachers can make deficit assumptions about families which then negatively influence the way they engage with students in the classroom.

Summary

A review of the different perspectives confirms that tension may exist between home and school for Pacific families. Parents want their children to do well but can feel distant from the learning process, resulting in lost opportunities to provide valuable support in the senior years of schooling. Teachers may need to change their approach so that home-school partnerships become more inclusive and promote a shared understanding.

Rethinking

As I prepare my doctoral proposal, I rethink my role as a researcher and consider how I might add value to existing literature. My position as a researcher is delicate. I am conscious that Western ways of knowing and acting are being questioned; the criticism is that colonialisation has superimposed its values upon populations of indigenous people, and

utilised models designed to help re-enforce domination by marginalising autonomy and self-determination (Burnett, 2007).

There is danger, however, in a reductionist view of culture, where fixed attributes are assumed (Burnett, 2007). Pacific communities are developing in international settings, with Pacific cultures evolving across “transnational spaces” (Ka’ili, 2005, p. 96). Young Pacific people are learning to be both Pacific and New Zealanders (Samu, 2006), developing cross-cultural skills so they can successfully negotiate the social spaces of both worlds (Mila-Schaaf & Robinson, 2010). Likewise, I hope I can be guided by conceptual frameworks – both Pacific and Western – and learn to enter both worlds.

I dared to enter

I dared to enter ...
A waka was passing by
And I stepped on
Emboldened by
Warm Pacific Greetings
My confidence grew
And in the distance
A mat was waiting on the shoreline

My ancestors were
Good people, so I believe
With class, wealth and
Emboldened by
Colonial adventure
Their confidence grew
Sailing from England
They sought more fortune in far-off lands

I dared to enter ...
Sitting at the very back
I watch and learn
Enticed by the
Warm Pacific waters
My fingers reach over
And trail down the side
They disrupt the rhythm of gentle waves

I think about
My history
Your history
Our history

In the distance
A mat is waiting on the shoreline

I am now poised at the water’s edge, considering how best to navigate a way forward. My aim is to be a facilitator not a fixer. Grateful for guidance, I believe I can engage in research

which helps map a course that brings families and schools closer together to secure academic success for Pacific students.

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The Area High School – A Flight into the Unknown

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Abstract

This paper, largely based on personal experience, reflects back on the circumstances leading to the Education for What? review in 1973 and the resulting changes in Solomon Islands education based on that report. It explores power relations by considering who made the decisions about the changes, how they were made, the rationale, and the ongoing impacts of these. Finally it weighs up the comparative benefits and disadvantages of “relevant” education and academic education in Solomon Islands.

Introduction

I have a special interest in the “Education for What?” report for several reasons: firstly the review was done during my final year at King George VI School in 1973. We were just the second group of students to have undertaken five years of secondary education in the protectorate. Prior to 1972, secondary education was provided up to Form 4.

Secondly, the review was about us and the Cambridge-based education system we were going through at that time. As students, we were the subjects of the review committee. The review was about Solomon Islands students and their future in a country soon to be independent. Of the five members of the review committee, two had been my senior primary school teachers.

Finally, my parents, although illiterate, had attended the review committee meeting held at Fo’ondo, North Malaita, in the Malaita District in 1973. While my father said the government men had talked about government and education, my mother observed that some of the men had long noses.

Out of the “Education for what?” report a new practically-based education system emerged. In this new system, I became a participant, an observer, a victim, and a critic. The title of this paper is: The Area High School – A flight into the unknown.

Area High Schools

Area High Schools were the practically-based institutions which were proposed to be set up to train students with skills useful for village life. The subjects to be covered included Agriculture, Business, Home Economics, Basic Mechanics, Woodwork, and Development Studies. Students who did not qualify to enter Form 1 at any of the six Secondary Schools would attend the Area High Schools, whose name was changed to “New Secondary Schools” and later “Provincial Secondary Schools”.

Flight may be referred to as a journey by plane or running away from something. Unknown refers to the future with no set destination. When these schools were set up, no one knew what would be encountered on that flight.

Education for What?

The review in 1973 was basically to find a possible answer to this question, “Education for what?” Prior to 1973, each of the five churches ran its schools along its religious doctrines, while the Government educated its students for its public service. Out of the review, it had been hoped a new education system suited to the needs of Solomon Islands would emerge. Solomon Islands consists of nine provinces: Choiseul, Western Province, Isabel, Guadalcanal, Central Islands, Renbel, Malaita, Makira-Ulawa, and Temotu. At the time, the population was about 160,000.

King George VI Secondary School with its Cambridge-based syllabus came under scrutiny by the review committee. Being the only Government Secondary School in the protectorate, the high level of support it received from the government should have surprised no one. However, the school was singled out for criticism for receiving the lion’s share of government funding and continuing to build “elaborate buildings” compared to mission schools. Whilst I am sympathetic with such sentiments, the missions could be considered to have had themselves to blame for this disparity, due to their unwillingness to cooperate with the government in the development of education.

By the early 1970s, widespread dissatisfaction was reported by politicians, missionaries, parents, and school teachers with the then “academically-orientated” education system operating in the protectorate. It had been claimed the education system was “alien” and imposed on the people by foreigners (specifically, white missionaries and government officers). It was unsuited to the peoples’ lives in the villages. People felt school leavers were lazy and unwilling to use their knowledge and new skills to develop their villages.

A six member Education Policy Review Committee led by the late Francis Bugotu was appointed by the Government to review the education system then. Five of the six members were Solomon Islanders, and the secretary was English. The Committee received oral and written submissions from individuals and groups. It toured targeted areas throughout the protectorate to hear peoples’ views. The outcome of the review was the “Education For What? report which is revisited at this conference in 2016.

The seven-year primary school programme ceased at the end of 1975 and was replaced by the six-year programme as recommended in the Education Policy Review Committee (EPRC) report. All primary schools became day schools, leaving the former senior primary school boarding facilities vacant. Some of these campuses were taken over by the newly introduced “New Secondary Schools”.

Preparation for the new system occurred in 1975, when recruited teachers underwent a one year teacher’s training course at the Solomon Islands Training College (SITC). Recruited teachers included skilled tradesman, primary school teachers, and former agricultural extension assistants.

The first phase or trial period for the proposals in the report was from 1976 to 1978. Upon implementation the name “Area High School” was changed to “New Secondary School” [NSS]. But the name “New Secondary School” still caused confusion amongst parents who questioned the secondary status of these schools, as students spent almost the whole day working outside the classroom. This had to be explained further by the Ministry of Education.

In phase one, standard 7 primary school leavers attended the New Secondary Schools for one year, whilst standard 6 leavers had to attend for two years. After one or two years the students had to return to their villages. This was a period of learning for everyone who got involved in this system.

The second phase occurred between 1978 and 1980. During this period, many ideas in the report were implemented. Changes occurred in the new system. The students were trained in general education, paving the way for either direct employment, further education, or to return home.

English and Mathematics were introduced into the New Secondary Schools in 1980, followed by a common examination in both subjects taken by Form 3 students from both New Secondary and National Secondary Schools in 1981. The name was then changed to Provincial Secondary School (PSS) in the same year.

Following the EPRC report of 1973, a lot of changes occurred. The Labour Market opened up with direct employment opportunities by multinational companies operating in Solomon Islands at the time. The Commonwealth Development Cooperation (CDC) which dealt with oil palm in the country and Solomon Taiyo offered job opportunities. Further training was offered at the then Honiara Technical Institute (HTI) and Solomon Islands Teachers College (SITC).

About 10% of Form 3 Students from PSS continued to Form 4 in one of the Six National Secondary Schools. Others were accepted by the Police, Hospital, and forestry sectors to do on-the-job training. Those who could not make it after Form 3 returned home (personal knowledge).

Flying blind

I joined the test flight on this new 'aircraft' in 1980, when I was appointed to be the new headmaster of Aligegeo Provincial Secondary School in Malaita Province. To be appointed a headmaster of a unique institution after three years in the teaching service was an achievement in itself. Being rather green in the field, I was excited and near to the wild heart of life. Never did I realise that I was a perfect example of "the blind leading the blind".

Then the challenges and attractions started to creep in. The school water pump broke down and there was no water for the school to use. We had to send students home. Like other sister Provincial Secondary Schools, the school became a centre of attraction to experts, consultants, and advisors from global institutions, and researchers from metropolitan universities. They were interested in how this unique institution was developing and whether it would succeed.

An important feature of the Provincial Secondary Schools was that their establishment had not been due to the report "Education for What?" or the white paper of 1975. It was the actions of personnel in the Ministry, who implemented the report according to their interpretation of it, which culminated in the NSS System. A letter from the Principal Education Officer (MECA) in the Ministry of Education would reflect this.

The NSS were established in former boarding facilities of Senior Primary schools. None was built on a new site. Volunteers were recruited to teach Agriculture, English, Mathematics, and Physical Education at these schools. These volunteers included VSO from England, VSA from New Zealand, Peace Corps from USA, and JOCV from Japan. None of the schools were designed for a New Secondary School as such. A curriculum committee was set up in 1975 to develop materials and set out the syllabus content for these schools.

Between 1976 and 1996 Solomon Islands had created yet another dual education system, namely the National Secondary Schools (academically-based) controlled by the Government and the churches, and the Provincial Secondary Schools (practically-based) controlled by the Provincial Governments.

Entry into both types of schools was dependent on a selection examination at the end of standard 6. About 12% of standard 6 students went into NSS while 20% proceeded to the PSS. The rest (68%) of primary standard 6 leavers are left to lick their wounds in the villages.

Another selection examination based on English and Mathematics was taken at the end of Form 3 by students in both NSS and PSS. On the basis of this exam, 10% of PSS students would continue to Form 4 at the NSS, 15% would be offered training at Solomon Islands College of Higher Education (SICHE), the police, nursing, and the fishing industry. The majority (75%) returned home.

In view of the quality of teachers and facilities available at the Provincial Schools, it was unfair to have PSS Form 3 students compete with the NSS Form 3 students in English and Mathematics. The PSS system was given second best treatment by the government with regards to grants, teachers, and administration. The provincial schools were looked after by the Principal Education Officer (PEO) in the Ministry of Education whose primary responsibility was to look after the national schools. It may be said that at the best of times, the PEO accorded the provincial schools after-thought treatment. At the provincial level the Senior Education Officer entrusted with the PSS in his province more often than not saw the PSS schools as an extra responsibility, as his primary role was to care for primary schools.

I admire the work done by the Education Policy Review Committee (EPRC) as a novelty, as it was done by Solomon Islanders. In other former colonies, such reviews had been done by experts, consultants, and advisers from the motherland. However, this good report was marred by its biased presentation. Nothing positive was said about academic education in the report, rendering it unrealistic. Hence, the education system had been changed based on what may be argued to be biased reporting and the pre-determined views of education administrators. This fact was immediately evident by the parents' rejection of the name "Area High School" and their confusion over the name "New Secondary School".

The issue of "education relevance" was used as a smokescreen to cover people's preferences for academic education. There are many and varied views held by different people on what "relevance" in education means. As Philip Foster (1965, p. 2) points out, relevance can be explained as "Something which meets the desires and aspirations of indigenous social groups, whether these aspirations are couched in terms of social prestige, economic wealth or a range of alternative desired ends". In this definition, it is the "desires and aspirations of the indigenous groups" that must be met. Policy makers and planners would no doubt have different views as to the relevance of people's desires and aspirations than those held by the people themselves.

In 1973, many members of the older generation who had strong beliefs in traditions were still alive. Many people then would have had no idea about education relevance. It was amazing to even to contemplate the idea of “relevance” in a society which had no academic tradition and a short history of formal education.

Through its “demonstration effect” Solomon Island parents believed academic education was more valuable than the type of education they were told was “relevant” for their children. While advocates of relevance encouraged the children of others to attend the vocational schools, their own children were sent to the academically-based national schools. As elsewhere, attempts at “relevance” in the Pacific had failed, showing preference for academic education is a universal human inclination (Irofanua, 1988).

The intended goal of relevant education was to provide education for the majority of people who were destined to live their lives in the villages (Irofanua, 1988). There is an assumption that people do not want to change, especially the rural dwellers. As pointed out by Whitehead (1980) echoing Friere, rather than plan with the people, the system was determined for them by those who “are convinced that they alone must decide, because they already knew what they have to do”. However, being elites, their plans remained elitist in nature. Whilst planners think nationally, parents think in terms of what is best for their own children.

Whitehead (1980) also cites Pacific academic Epeli Hau‘ofa’s observation that the most common response to the mounting concern with the relevance of academic education in island communities had been the introduction of a dual system in which the academic is reserved for the privileged while the more rural and technically orientated are devised for the poor. Unless someone dared speak on their behalf, the voiceless, the powerless, and the academically marginalised would remain subservient to the elites’ plans in education.

Education relevance took on a special meaning in this far-flung backwater of the British Empire in 1973. With political independence just around the corner, planners and policy-makers had learnt from the mistakes of other former colonies which produced too many educated youths who drifted to towns to find no opportunities for employment.

It was felt that the protectorate, with its affluent rural life style and natural resources endowment, should be able to provide for its youths. As the villages were (and arguably still are) better places to live, it was concluded that many of our youths should continue to live in the villages. While “Education for what? focused on school leavers, (primary and secondary) the other two youth groups – the school drop-outs and the unschooled who also flock to urban areas – were over-looked. Today, influenced by the media, TV, the internet, mobile phones, newspapers, and their peers, it would be monumental to convince young people to remain in the villages.

The report approached the issue of relevance with gloom and doom. The 1973 situation was projected into the future, assuming that the situation was impossible, and it paralysed action. Individuals’ dynamic and imaginative capacity to overcome challenges was unduly underestimated.

The Europeans involved appear to have seen themselves as the bearer of the “Whiteman’s burden” to take civilization to the darker races. Their arrival in Solomon Islands presented an incomplete picture of European societies. They came as missionaries, plantation owners,

District officers, District Commissioners, and doctors, but there were no labourers or prisoners of European origin. It was not until 1977 when I reached Auckland University that I saw a white man picking up garbage. With them they brought their tools, food, clothing, religion, this magical thing called “education” and “time”, which controlled all their activities. It is education and time which set the Whiteman apart from the natives.

Under colonial rule, natives were referred to as “boys” not “men” as in the Whiteman’s world; they only served as “Labourers”. Europeans were the men as they were called “Masters”. Natives believed that to be a Master, they must have the Whiteman’s education. The “demonstration effect” of academic education through the missionaries, the colonial administrators, and plantation owners captivated parents to wanted academic education for their children. It was the Whiteman’s conviction that natives, being backward, must emulate European social organization. Modernity or civilization which is identified with the Western world is believed to be the destiny of the human race.

To Solomon Islands parents, “education relevance” is a non-issue. What parents want for their children is survival, security, status, and freedom in a rapidly changing Solomon Islands society. From the Westerner’s point of view, Solomon Islanders were (and still are) living under the bondage of ignorance and are submerged in poverty. Spiritually, they are strangers to paradise. To be emancipated from all these, parents believe, academic education (not “relevant education”) is the ultimate panacea.

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Factors Affecting Implementation of Agriculture Curriculum in Urban Primary Schools in Solomon Islands

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Abstract

Curriculum implementation is the process of using produced or recommended teaching, learning materials and approaches which need to be evaluated regularly. This evaluation focuses on exploring factors affecting the teaching and learning of agriculture within primary schools in Solomon Islands (SI). The topic of the study is, “Factors Affecting Implementation of Agriculture Curriculum in Honiara City Primary Schools, Solomon Islands”. The study was underpinned by Fullan’s theoretical framework of factors affecting the implementation of curriculum.

The data were collected using survey questionnaires, which were administered to ten primary school teachers. The analysis of the data involved descriptive statistics and thematic analysis. The themes used were developed from both the literature and the data.

Although the data showed that agricultural knowledge and skills are important, the curriculum in use is not relevant or practical, and the teachers in primary schools have not been effectively teaching it. The data suggests that there is a need for training and equipping the teachers so that they can teach agriculture more effectively. The study also indicates that further development of agriculture courses is consistent with the government’s plan to revise the school curriculum.

Background on agricultural activities and education

Solomon Islands (SI) is a developing Pacific Country. The majority of SI people are engaged in three levels of agricultural activities, which include: subsistence, semi-subsistence and commercial agriculture (ESCAP, 2010). Most of the livestock farmers in SI are small holders who raise chickens and pigs to sell at the local market. To do that, they must have the basic knowledge and skills for improving agriculture practices, products, and financial management. For those who are already equipped with the basic knowledge and skills, the education could further what they already know.

Some parts of SI have developed since the arrival of Westerners, whilst the majority of people continue to live more traditional lives employing a subsistence farming life, and are directly connected to the environment, land, and its culture (McGregor, 2006). This includes using plants and animals for personal consumption and cash income. According to McGregor (2006), the people are engaged in subsistence agriculture, producing and selling food crops including taro, yams, cassava and sweet potato; as well as cash crops including copra, cocoa, vanilla and coffee. SI, as a country, exports agricultural products including palm oil, copra, coconut oil and cocoa. The agricultural and fisheries sector accounts for approximately 80% of the GDP of SI, making agriculture the principle economic activity. SI needs specific education in producing and exporting agriculture produce so that the country can continue to export (McGregor, 2006). “Agriculture plays a vital role in SI society but traditional shifting cultivation method of farming cannot support today’s increasing population as well as the exporting needs of the country” (Solomon Islands Curriculum Development Centre, 1983). Thus, there is need for change in the approach to farming.

Agriculture is one of the important subjects in primary schools. This is because 75% of the SI population receive only primary education, and only 4% of the students move on to secondary schools (USPIE, 2002). This means basic survival knowledge and skills in agricultural education must be provided in primary schools to equip the majority of young people. Schools are expected to include agriculture studies in their timetable and help the students develop basic agricultural knowledge and skills. However, there was a general feeling that the government was not doing enough about agricultural education. This included the feeling that the teachers were not well-trained for teaching agriculture, and the schools were not equipped with agriculture tools and materials (MEHRD, 2005). It is for this reason that this study was carried out, in order to determine whether or not agricultural education in Solomon Islands primary schools is being taught as it should be, and if necessary and relevant agriculture knowledge, skills, and values were taught using appropriate approaches and activities.

To do that, the study was undertaken to answer the following research questions:

1. How well is the agriculture curriculum being implemented in urban primary schools on Solomon Islands?
2. What are the challenges faced by primary school teachers in implementing the agriculture curriculum?

Literature Review

Curriculum Implementation

The implementation of curriculum is a process which requires time and effort to achieve the intended outcomes (Fullan, 2001). The recommended teaching and learning approaches and activities can be easily followed if they are explicitly clear (Fullan, 2001). The content to be covered includes the knowledge, skills, and values to be developed and the learning approaches and activities to be used (Parr, Trexter, Khnna & Battisti, 2006). That is crucial because teaching and learning of subjects is effective only when the teachers use the curriculum material and teach the students using the recommended approaches (Posner, 1995).

Factors associated with the curriculum itself, factors related to the responsibilities of people in the school, and factors external to the school are the main factors that affect implementation of the curriculum. These factors interact with each other and influence the degree of implementation, which in turn affects the attainment of desired learning outcomes. With implementation, the process will be less effective if one or some these factors work against it.

Curriculum materials

Teacher's support materials are necessary and often serve as a compass to give teachers directions on how to implement the curriculum. They must be made available for the teachers to use with their students (Fullan, 2001; Nachmias, Mioduser, Cohen, Tubin & Forkosh-Buruch, 2004). Usually each has a set of materials, such as textbooks and curriculum materials such as a syllabus or teachers' guides (Openg, 1998). For agricultural education, apart from curriculum materials and text books, land space, tools and other resources should also be made available (Parr et al., 2006). Teachers, as direct implementer of the curriculum, must see and understand the importance and benefits of teaching agriculture using the approaches and activities recommended in the curriculum (Fullan, 2001; Openg, 1998; Posner, 1995).

The knowledge, skills and values to be acquired and developed recommended in the curriculum must be relevant (Tilbury, 1995).

Knowledge in curriculum

Posner (1995) identified knowledge as ‘knowing that’ and ‘knowing how’. ‘Knowing that’ is often referred to as subject content knowledge, whilst ‘knowing how’ is often referred to as knowledge about procedures and skills. ‘Knowing that’ is learning about facts and concepts about the subject, whilst learning about the procedures and skills. Learning about procedures and skills without actually practising them is ineffective learning. It would be similar to learning how to make gardens and look after livestock without actually making the garden or looking after livestock (Reidmiller, 2002).

Skill development usually requires practice. The learner’s ability is demonstrated when he/she actually uses the skill (Parret al., 2006; Posner, 1995). Learners knowing about agriculture concepts and procedures does not mean they already have the knowledge and skills. Thus, as part of agriculture teaching, the students should be provided with opportunities to acquire both knowledge and skills. The knowledge, skills, and experience they gain in schools will become stepping stones for further knowledge and skills development (Parret al., 2006).

Pedagogy in Curriculum

Learning approaches and activities recommended for use should be appropriate and relevant for the subject, culture, grade level, and the society, and must be in line with those recommended in the national curriculum policy (Tilbury, 1995; WTO, 2011). At the same time, the expected outcome should be practically achievable and able to result in deep learning (Dodd, 2011). Practical subjects such as agriculture should help students develop deep knowledge, important skills and values when they are actively involved in authentic practical activities (Parr et al., 2006; Tilbury, 1996). Lack of use of the suggested teaching strategies with the curriculum materials may result in failure to achieving the intended student outcomes (Fullan, 2001; Openg, 1998; Riley, 1990). According to Fullan (2001) and Openg (1998), the schools where all teachers used recommended teaching strategies were successful and had positive student achievements. The schools where teachers used varied teaching strategies had less successful implementation, with negative student achievements. This includes the schools that use actual projects for teaching agriculture knowledge and skills.

Curriculum Relevancy

A study in environmental sustainability education, carried out by Ernest and Monroe (2006) involving 23 Florida high school students, found that one thing that facilitated effective development of knowledge and skill was the use of locally relevant issues (Openg, 2012). Teachers and students can become resistant to the teaching and learning of the subject if knowledge and skills for development, approaches, and activities for use in delivering are culturally inappropriate and irrelevant to them.

Having an agriculture curriculum in SI primary schools is relevant and appropriate because the majority of people in SI live in rural settings and employ basic subsistence farming to survive (Parr et al., 2006). In addition, a majority of young people in the country only complete their primary education (Reidmiller, 2002). With teaching and learning activities being locally relevant and appropriate, the chances of fostering locally useful knowledge, skills, and values would increase. The inclusion of practical activities and indigenous

knowledge and skills in the curriculum, as well as the teaching and learning of agricultural education, is a clear attempt to contextualize the curriculum thus making it more relevant to the societies (Parr et al., 2006; Van Damme & Neluvhalani, 2004).

Schools system

Effective implementation of curriculum lies at the school level because implementation of the same curriculum guidelines or policy is frequently successful in some schools, while unsuccessful and discouraging in others (Fullan, 2001; Openg, 1998). This difference is caused by lack of availability, support materials and resources, overspending of funds, and the roles and inputs of teachers and students in the implementing of the curriculum (Fullan, 2001). Moreover, teaching and learning can be ineffective in schools that lack the necessary materials and resources.

Planning and allocating time for different activities is an important part of curriculum implementation. This includes allocating time for in-service training, and meeting times for the teachers to reflect and to discuss activities and issues related to the teaching and learning of agriculture. The teaching of practical subjects like agriculture often require more time to deliver than the other subjects.

According to Fullan (2001) and Nachimias et al. (2004), implementation was successful in schools that planned, allocated, and used funding for curriculum implementation because planning enables the mobilisation of necessary funds for purchasing materials and resources, and for facilitating meetings and in-service training for the teachers who implement the curriculum (Fullan, 2001; Parr et al., 2006). For practical subjects, it is important that the school buys and provides the needed tools and resources (Thobega, Subair, Mabusa & Ramolai, 2011). The study in Ovia North East Local Government Area, Edo State was carried out to uncover factors affecting the teaching and learning of agricultural science. The results revealed that insufficient land, inadequate simple farm tools, lack of up-to-date instructional materials, and lack of agricultural laboratory equipment are some of the factors affecting the teaching and learning of agricultural science. Those findings are in line with Fullan's view that schools which plan, allocate, and use funds for curriculum implementation are usually more successful than those who do not (Fullan, 2001).

Teachers' Understanding

To provide effective education, teachers need to deliver subject content from the recommended curriculum using the recommended approaches and activities (Posner, 1995). Teachers frequently cover the content knowledge without helping the students develop the needed skills and values they need for the reason that the teachers themselves do not understand the curriculum (Posner, 1995). Many subjects fail to achieve intended subject goals because the subject teachers do not understand the concepts, skills, and values to be developed or the approaches and activities to be used (Fullan, 2001; Openg, 1998). People, including the teachers, need to understand the importance of implementing a subject curriculum, such as the implementation of agriculture curriculum in SI schools (Parr, Trexter, Khnna & Battisti, 2006). Teachers also need to understand the importance of teaching agriculture, because the majority of SI people live in rural areas and need basic subsistence farming to survive. Furthermore, they need to understand that providing agricultural education is a step towards addressing local food security issues, poverty, and global environmental issues (Reidmiller, 2002). Teachers also need the knowledge and skills relating to current recommended practice in sustainable agriculture (Parr et al., 2006).

Teachers Teaching Agriculture

Teachers effectively teach the subject when they are confident in their knowledge and classroom practices. Often it is a teacher's lack of confidence which inhibits their implementation of curriculum, rather than their limited subject knowledge and background. More often, their lack of confidence stems from the belief that their subject background knowledge is inadequate. Thus, teachers involved in the teaching of the subject must be provided with adequate training, especially regular and specific in-service training to increase and maintain their knowledge, confidence, and experience (Openg, 1998; Wiles, 2009).

Teachers' knowledge and understanding of the subject and pedagogy for teaching the subject is important for effective implementation, but they do not have to be specialised in the subject (Openg, 1998). Initial specialised education is not necessarily important for teaching the subject so long as the implementation process includes some in-service provision (Posner, 1995; Wiles, 2009). Teachers can be advised and encouraged to identify, select, and use the most appropriate teaching methods and resources to achieve subject outcomes during meetings and in-service trainings. Failure to provide in-service training on knowledge, skills, and procedures can hinder implementation of curriculum (Openg, 1998).

Traditionally in agricultural education, the younger generation were taught agricultural skills and maintenance of livestock from their parents and older relatives (Reimmiller, 2002). However, that is no longer the case because children are spending more time in schools and less time at home. For that reason, school teachers are expected to teach the basic knowledge, skills, and procedures to the students. To be effective, the teachers need to use the approaches and activities that are recommended for delivering the subject (Fullan, 2001). In practical subjects like agriculture, the students are expected to learn by being engaged in purposeful real life activities (Parr et al., 2006).

Another factor that causes failure in implementation is the teachers' varying views, interests, and attitudes about the teaching and learning of the subject. This causes ineffective implementation of the subject (Fullan, 2001; Openg, 1998). For effective development of knowledge and skills, recommended learning activities and strategies should be clearly communicated through regular in-service trainings and meetings. During those activities the teachers can reflect, discuss and share with each other the knowledge and experiences they found to be effective (Hart, 2009).

Students' Learning

Students are important factors in the educational process, because without them it would be impossible to implement a curriculum. Curriculum implementation only occurs when the students acquire the planned or intended experience, knowledge, and skills. Students must know the importance of studying the subject (GESAPP, 2009). Students must be clearly informed about what they need to study and why it is important for them to study. The teachers can be facilitators of good classroom practices as they are responsible for what is actually transmitted and adopted from the subject or official curriculum (Chikumbu & Makamure, 2000). However, what the students actually learn and adopt can be quite different from the intended lessons, which often results from their own beliefs and attitudes.

For agricultural education, provision of materials and resources, including land and tools, make practical lessons effective (Parr et al., 2006). This is because agriculture knowledge and skills are effectively developed when students are involved in real life activities. Supporting education with resource materials is a significant way to achieve better results.

Effects of External Factors

Factors external to the school include: government departments, other institutions and organisations, and family and community members. Nickson (2000) and Ernest (1988) said factors affecting students' ability to learn a subject effectively starts from the classroom and moves to a wider school community. It can be difficult when family, community, and other stakeholders do not see themselves as members of the implementation team. School administrators and teachers need to work together with other organisations outside of school in order for agricultural education to be successful. Some students fail to achieve their goals because the extra help and support they need to be successful is not provided by the family, community members, or other institutions.

Summary of Literature Review

The teaching and learning of a subject, also known as curriculum implementation, provides planned and unplanned learning experiences. Learners are provided with the opportunity to develop experience as part of the implementation. Curriculum implementation is the process by which individuals or groups use recommended or desired curriculum to achieve desired goals. Implementation is often affected by a number of factors. Most often, implementation is affected by including the curriculum itself, the school, and some factors external to school. The effective implementation of the curriculum is dependent on how clear, relevant, practical and available the curriculum is, as well as how organized the school is, and how knowledgeable and committed the staff, students, and other stakeholders are about their roles and responsibilities in the implementation. Thus, it is important that this understanding is established for effective implementation. The next section briefly describes the methodology used in carrying out the research.

Research Method

The data were collected and analysed to find out if agriculture studies was being effectively implemented in SI primary schools. To collect, analyse and present the data, certain methods and methodologies were used and they were underpinned by a paradigm. This research is underpinned by the interpretive paradigm, because of the nature of the study of agricultural education practices. This is consistent with knowledge and skills development in agriculture because it is based on people's beliefs, relationships, and actions on the land and environment as a whole. Peoples' attitudes and actions towards the environment are also influenced by their culture and their past experiences.

Specifically, the research study was conducted in five primary schools in Honiara, Solomon Islands. The study was carried out to collect data to evaluate practices of agricultural education in primary schools in Honiara. Ten teachers from five participating schools provided the data. The data were collected using a questionnaire, which had two types of questions or items. There were 25 structured questions, of which three were scaled questions and seven were open-ended questions. The responses from the teachers were gathered by asking participants to place a tick in the box beside 'Agree', 'Not Sure', or 'Disagree'. Questionnaire data for all sections were analysed using simple descriptive statistics in which the percentages were calculated. The responses to open-ended questions were used to support the data from the survey questionnaire. The data were coded and the information from coding was written in narrative passages, which were then interpreted and links were built by studying patterns, categories, and relationship in the data (Burns, 2000).

Findings of the study

This section presents other teachers' perceptions of primary school teachers in Solomon Islands. It is divided into three subsections: factors associated with curriculum, and with schools, and factors external to schools. The first subsection presents the data on factors associated with curriculum; the second subsection presents the data on factors associated with schools; the last subsection presents the findings on factors external to schools.

Curriculum in School

The respondents also stated that the skills contained in the curriculum materials are irrelevant. The knowledge it contains is also irrelevant, with 80% of the learning activities deemed impractical. The respondent commented that, "having clearly prescribed curriculum material is important. As long as the teachers have curriculum materials made available, [the teachers in] most schools will do a good job". According to respondents, teachers have not been effective in teaching their students agriculture because the teachers lack relevant and practical curriculum in agricultural studies.

Knowledge in Agriculture Curriculum

The respondents (100%) said that agricultural knowledge is very important and should be treated and taught as a core subject. The agricultural knowledge that students gain in school will help them solve most of their social problems (50%). This important and relevant knowledge should be delivered using effective approaches. However, the respondents believe that agricultural knowledge provided in primary schools is not relevant (60%). A respondent also commented on content knowledge: "Although theoretical agricultural knowledge is important, it is not always taught to the students [because] most primary school teachers are not trained enough to teach agriculture, also because they not have good, clear curriculum materials".

Skills in Agriculture Curriculum

Respondents believe that agricultural skills are very important in contemporary society (80%), and developing them is relevant or appropriate for equipping primary school children before they leave school (90%). The respondents said these skills should be taught effectively in schools to equip the students before they leave school (90%). The skills the students develop in school will help them solve most of the social problems they experience once they leave school (60%). This view is supported by comments made by two respondents when answering open-ended questions: "practical agriculture skills are important however they have not been practiced in schools today" and "most teachers are not specialists in teaching agriculture so they only teach theory lessons and not the practical lessons which will help develop [the students'] agriculture skills". Thus, there is a need to emphasise agricultural skills in the school.

Factors Associated with the School System that Affect Implementation of the Agriculture Curriculum

Primary schools do not have enough time (noted by 70% of respondents), land (60%), necessary tools and resources (70%) for teaching practical agricultural lessons. The respondents also said the primary schools do not have funds to buy tools and resources for teaching agriculture (50%). This view is supported by a respondent, who said, "Agriculture education is important, but the teachers in the primary schools do not teach it because the

schools do not have the materials (resources) and allocate less time for agriculture, have no tools and land spaces to do practical”. This could mean the teachers do not understand the agricultural curriculum and their roles in implementing it. It could also mean that they lack confidence in teaching agriculture.

Factors Associated with Teachers that Affect Implementation of Agricultural Curriculum

Respondents have varied views about the teaching of agriculture in schools. Results indicate that 40% of respondents think their teaching is quite effective, the other 40% found their teaching ineffective, while the rest were unsure. Half of all respondents believe primary school teachers are not trained well enough to teach agriculture, and usually lack knowledge about preparing and presenting agricultural lessons (80%). Seventy percent of respondents reported that they usually find teaching agriculture very challenging. Among the 70% a couple of respondents reported, “Primary school teachers are not trained to teach agriculture so they find it hard to teach” and, “Teachers do not help the students develop agriculture knowledge and skill because the teacher themselves also lack knowledge and skills for teaching agriculture.”

Factors Associated with the Students that Affect Implementation of Agricultural Curriculum

The results show that the students are not aware of the importance and benefit of agricultural knowledge and skills (60%) and most students are not interested in learning agriculture (90% of respondents noted this). On the other hand, the respondents reported that the agricultural knowledge and skills which students develop in school will help them solve the kinds of social problems that those who leave school will experience (60%). Despite the fact that agricultural knowledge and skills are important for the students, they were not interested in learning agriculture. This could be because they do not understand the importance and benefit of developing agricultural knowledge and skills.

Factors External to Schools that Affect Implementation of Agricultural Curriculum

All respondents believe that secondary school teachers who are specialised in teaching agriculture should assist primary school teachers to teach agriculture. They also stated that the primary school teachers find teaching agriculture to be very challenging. The teachers thus overcome the challenges by seeking assistance from the secondary school teachers (80%). “Being a generalist primary school teacher does not stop me from teaching agriculture. I must be creative and improvise to at least teach agriculture.” Another stated, “[I] seek assistance from other agriculture teachers, especially teachers in secondary schools.” This could mean the needed in-service training and reflection and discussion times are not provided for the primary school teachers.

Summary of findings

Many factors influence and affect implementation of the agricultural curriculum in Solomon Island primary schools, such as factors that are associated with curriculum, school, and others. The results show that the agricultural curriculum in use is considered irrelevant because it contains knowledge and skills that are not relevant and practical. Although agricultural knowledge and values are important and should be taught effectively as a core subject, this is not happening. The provision of funds, land, time and tools by the school are very important for the effective implementation of the agricultural curriculum, and yet they are not made available by the schools. Furthermore, having teachers who are well-trained or regularly in-

service trained in the curriculum of the subject is important for effective implementation. This, too, has yet to be done for many agriculture teachers in Solomon Island primary schools. Teachers have been seeking assistance from high school teachers to teach agriculture. That is good, because effective implementation of the curriculum will occur when all stakeholders work collaboratively.

The knowledge, skills and values people gain from agriculture lessons are very important for survival in Solomon Island societies. However, the students are not interested in developing them because they are not aware of the importance and benefits of the lessons.

Discussion

Effective implementation of curriculum is dependent on a number of factors including: the curriculum, teaching and learning in school, and the external factors associated with curriculum, teaching and learning (Fullan, 2001; Openg, 1998).

Agriculture Curriculum

Curriculum designed and implemented must be in line with, and underpinned by, the local government and education policies. At the same time, it must address the cultural and social needs of the students. According to the results of this study, agricultural knowledge and skills are important. They are needed by the people to solve social and environmental problems (Parr et al., 2006).

Important knowledge and skills concerning agriculture are basic survival knowledge and skills that should be delivered in a locally relevant and culturally appropriate way (McKeown & Hopkins, 2003, Openg, 2012). The knowledge and skills delivered must be relevant to the students' needs, culture, and curriculum (Openg, 2012). The education provided is not effective when the students are engaged in the activities and when the material is not relevant and cannot be linked to the students' experiences (Tilbury, 1995). Furthermore, knowledge and skills developed in the subject must be locally relevant, practical, and workable. Agricultural knowledge and skills included in primary curriculum education must equally be relevant to the students' needs, culture and curriculum (Parr et al., 2006). SI as a nation, like other nations, is currently experiencing many social and environmental issues, which they must find direct and indirect resolutions for, using both knowledge and skills. However, the agricultural curriculum in use is not relevant and practical because it contains knowledge and skills that are not relevant and practical, making the implementation of it difficult. The students can become resistant to developing the knowledge and skills if the approaches and activities used in delivering the knowledge and skills are culturally inappropriate and irrelevant to them.

Agriculture in School Systems

The effectiveness of agricultural education is dependent on several things including: availability of funds, materials, and resources; the planning and management of the curriculum and the support materials and resources; the people involved and their roles and responsibilities (Fullan, 2001). The roles, actions, and inputs of teachers in teaching the subject is often dependent on what the support school provides for the teaching and learning processes.

In addition to leadership in planning, allocating, and managing time, funds and other resources, should also be provided for teaching and learning of agriculture. SI, like other

developing nations, needs agricultural knowledge and skills for survival, and that should be provided by the government and school principals. However, the schools do not allocate enough time, land, tools or resources for teaching practical agricultural lessons. The primary schools do not have funds to buy tools and resources for teaching agriculture (Parr et al., 2006). This could mean the head teachers and teachers do not understand the importance of an agricultural curriculum and their roles in implementing the curriculum. Thus, there is a need for specific in-service training on the importance of teaching agriculture and how it can be taught effectively (Fullan, 2001).

Teachers' Teaching Agriculture

The results show that the teachers in the primary schools do not teach agriculture as often as expected. It is very important that the teachers are well-trained and knowledgeable in the subject and are confident in delivering it. The teachers must have the subject content and pedagogical content knowledge (Posner, 1995), know facts and concepts about the subject, and know about the procedures and skills which include knowledge on how to effectively teach it as a subject. Oftentimes, the development of knowledge requires practice, and the ability is demonstrated when the learner actually uses the skill (Parr et al., 2006; Posner, 1995). However, the results show that the primary school teachers are not well-trained for teaching agriculture and lack agricultural knowledge or pedagogical knowledge and skills.

The primary school teachers often find teaching of agriculture challenging and so, as a result, their agricultural lessons are ineffective. Thus, there is a need for providing regular and specific in-service training on agricultural knowledge and skills and pedagogical knowledge and skills to help the teachers deliver agricultural education effectively (Fullan, 2001). However, initial teacher training and subject specialisation may not necessarily be sufficient for teaching the subject, as it depends also on the implementation process (Posner, 1995; Wiles, 2009). The teachers need to have sound knowledge of the subject and recommended learning approaches and activities as well as regular and specific in-service training on teaching of the subject (Openg, 1998). Failure to provide in-service training on knowledge, skills and procedures can hinder implementation of the curriculum.

Students' Learning in Agriculture

In order for students to develop an interest in the subjects they are learning, they must be aware of the importance of all the subjects that they study and about their roles and responsibilities in learning the subjects. Students' attitudes towards the subjects are important in their knowledge and skills development in the subject (Kele, 2014). In this case, the importance of developing an interest in agricultural education is crucial in order to survive in a developing nation like SI. However, the results of the study show that the students are not aware of the importance and benefits of agricultural knowledge and skills. They do not know that the agricultural knowledge and skills that they developed in school will help them solve social and environmental problems. This could mean the students are not aware because they were not informed about the importance and benefits of learning the subject. It could also mean they were not taught using relevant and appropriate approaches and activities (Dodd, 2011). Thus, there is a need for in-service training to create awareness for students on the importance and benefit of agricultural education, and on the relevant and appropriate approaches and activities for delivering agricultural education (Fullan, 2001).

External Effects on Agricultural education

People in organisations external to the school can help in the implementation of the curriculum. This is important because implementation of curriculum requires collaborative effort to develop students. Apart from the policies created by the Ministry of Education, they are also expected to provide continual political and financial support, as well as require the cooperation of everyone that is in and around the schools (Fullan, 1982, 2001). The participants reported that the teachers have received some assistance from the secondary school teachers in teaching agriculture, and they are expecting more assistance. They claim that the secondary school agriculture teachers are in a better position to train them because they are more specialised in agriculture.

Conclusion

Early agricultural knowledge, skill development and readiness are recognized to be significant in preparing the students to accomplish returning home successfully. The importance of early education in the development of agricultural skills in a child is reason to evaluate the curriculum implemented. Although primary schools commonly implement different teaching instructions, they often provide different materials without assessing whether the application of these methods will address the individual needs of the students. The inability of primary school students to acquire the necessary knowledge and skills in agriculture will prevent them from returning home successfully. This is mostly brought about by inappropriate teaching methods in the primary school classrooms.

Recommendations

First, provide findings of the research to teachers in primary schools in Solomon Islands so it can help them make changes in their preparation and presentation of agricultural lessons. Second, provide in-service training for teachers in primary schools in SI relating to how they could address some issues at their own level. Third, revise the existing agriculture curriculum to include relevant knowledge and skills. Fourth, present findings of the study to the National Teacher Education Board of Solomon Islands.

Implications for Further Research

Further research following on from this study could be conducted on the following:

- detailed studies of factors affecting the teaching and learning of agriculture in primary schools
- to assess the extent to which agricultural lessons are being taught in primary schools
- work on the development and implementation of agriculture related courses for primary schools
- detailed studies of factors affecting the teaching and learning of agriculture in primary schools and in other areas related to that, such as the agriculture-related curriculum in teachers' colleges
- to examine how primary school leavers are using the agricultural knowledge and skills that they have developed in primary school.

Most of the above mentioned aspects could not be covered in this current study due to time and financial limitations, but are worthy of careful consideration.

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Are learners' poor attitudes towards Mathematics tutorial activities affecting their academic performance?

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Abstract

Tutorials are one of the only times during which teachers can receive feedback from their learners. However, in recent years, there has been a sharp decline in learners' attitudes towards doing their tutorial activities, thereby detrimentally affecting future assessed work towards their overall performance. During the first semester in 2016, a survey was conducted to support the study of Mathematics learners for years 2 and 3 who were enrolled at the Panatina Campus, SINU. The survey was implemented using a simple random method-based questionnaire on each respective level. Each target group for both levels were comprised of an equal mix of both male and female learners. The survey consisted of a set of closed questions that were tallied according to each type of response and used in the analysis. The results indicated that learners' poor performance was attributed to little time invested in doing tutorial activities as well as preparation prior to the start of tutorial sessions. The level of performances showed the following: MT251 (TS2) learners responded poorly; MT251 (TS1) fell in the middle; MT354 (TS1) fared best. The results further revealed that having no space to study, and personal idleness, are the two main factors that prevent a learner from doing a tutorial activity. These findings suggest that learners may become incompetent and less-confident in their future workplaces.

Keywords: Mathematics, tutorial activities, overall performance, assessment, Solomon Islands.

Introduction

A learner's poor response in doing a tutorial activity may relate to a wide range of factors, such as: poor class attendance, less preparation time, less motivation, poor participation, [and] poor self-reflection (Lew & Schmidt, 2011; Massingham & Herrington, 2006; Tella, 2007). These factors further include learners' failure to do a given task at home or not completing prior reading of material before a tutorial session starts, shyness, having less confidence, and so forth. This has become increasingly a major concern in many colleges and universities around the world (Ames & Archer, 1998; Moloko Mphale & Mhlauli, 2008; Weaver, 2006).

According to Weaver (2006), comments that are too general, not clear, a lack of guidance and focus on criteria unrelated to the assessment are all factors that can prohibit the improvement of learning. Moloko Mphale and Mhlauli (2008) further state that high teacher morale, availability of resources, and parental involvement are vital for attaining quality of education in Botswana. Again, Massingham and Herrington (2006) did a survey on the changing attitudes of students towards their learning at the faculty of commerce at the University of Wollongong, Australia. They found that student attendance has an impact on performance. The authors stated that students who attended lectures and tutorials had a better chance of success on all assessment tasks and, in particular, the final exam, than those who may have genuine reasons for non-attendance. The authors further suggested that teachers should give learning tasks that are spread evenly throughout the semester rather than something at the far end of the semester.

Other studies reported that learners with mastery goals in the classroom used more effective strategies, preferred challenging tasks, had a more positive attitude toward the class, and had self-reflection self-efficacy, which, to some extent, contribute to the performance of learners (Ames & Archer, 1998; Lew & Schmidt, 2011; McKeachie, Pintrich, & Lin, 1985; Usher, 2009). Further studies by Ames and Archer (1998) note students' learning strategies and motivation processes as key factors in achievement in the classroom. The authors suggest that when mastery goals are more important and are adopted by students, the classroom goal orientation may facilitate the maintenance of adaptive motivation patterns.

In addition to Ames and Archer (1998), Tella (2007) studied the impact of motivation on students' academic achievement in Mathematics among secondary school students in Nigeria by using an academic motivation and preference scale as a measuring instrument and achievement tests in mathematics. The results showed that gender differences had a significant impact on motivation in academic achievement. Peer tutoring is another way to improve a learner's poor performance. However, the literature showed mixed results. For instance, some studies (Harris & Sherman, 1973; Kirk, 2000) reported that peer tutoring procedures have improved rates of performance while others, such as Kaufman and Schunn (2008), regarded peer assessment as unfair and believed that peers are oftentimes unqualified to make assessments.

Conversely, Mlambo (2011) found that none of the investigating factors such as motivation, socioeconomic status or attendance affected the students' performance in an introductory Biochemistry course at the University of the West Indies. Another study, Schoenfeld (1988) revealed the disaster of 'well-taught' Mathematics courses for tenth grade geometry. On one hand, the author found that the learners were well-taught and well-managed by standard performance measures, but on the other hand, the course only neutrally impacted the students. It can be seen from the literature that there were mixed findings relating to the factors that affect a learner's academic performance.

In Solomon Islands, few studies have been done on learning Mathematics (Malefoasi, 2010) and Sciences (Hayes, 1992) and were done only at secondary level. However, none were done at the tertiary level. This study sought to find out if poor responses towards tutorial activities are affecting the academic performance of adult Mathematics learners at the Solomon Islands National University (SINU), Panatina campus. Here we notice a declining trend in students' performance as measured by their overall score at the end of the semester. The author, one of the lecturers of these courses, observed that the learners failed to connect their knowledge from what they learned in one tutorial session to another. The strength of the tasks given ranged from basic to intermediate to advanced level. It is concerning that most of the learners found it difficult to understand and solve basic Mathematic problems taught to them in the previous tutorial. The impact of this problem cannot be ignored as it will add an extra burden to fee-payers, sponsors, and the national government. The answer to this problem may not be easy to uncover. These have raised questions that form the basis of this research paper.

The first objective of this research paper is to find out whether the number of hours spent on each tutorial activity, reading their materials before and/or after each tutorial sessions have an effect on the learners' overall academic work performance. The second objective is to find out what factors are preventing learners from doing their tutorial activities. And thirdly, it is to provide a baseline study and identify areas for future research.

In this study, a survey was done with a selected group of students from years 2 and 3 who were attending courses (MT251 (TS1) MT251 (TS2) and MT354 (TS1)) at the Solomon Islands National University (SINU), Panatina Campus during Semester 1 of 2016. TS here refers to the learners' teaching subject (or majors) in which they expect to teach after graduating from the University.

Data Collection

The data used in this research were collected based on a closed set questionnaire and the overall score in the Mathematics paper at the end of the first semester in 2016. The survey was conducted at the end of week 13 of Semester 1, 2016 at SINU, Panatina Campus.

Methodology/ Procedure

The survey was implemented using a simple random method amongst students in years 2 and 3. Selected years 2 and 3 students doing courses MT251 (TS1), MT251 (TS2) and MT354 (TS1) were our target groups. The sample size for each group was $n=20$. Data was then tallied and tabulated for various analyses. The genuineness of the survey depended on two assumptions: a) the participants answered the questions independently and b) they read and understood the questions before they wrote down their responses.

Results and Interpretations

In this section the results and interpretations of learners' responses with their respective variables are presented in Tables 1(a-c). Factors that hindered them from doing their tutorial activity are presented in Table 2.

Learners' Responses and the Variables

In Tables 1a to 1c we compare the results of the various tutorial responses against the average scores for each group. We then compare each individual group with positive and negative responses against their respective scores. Table 1a shows the average number of hours each group spent doing their work against the average overall score. In Table 1b we present the average score of each group on whether a learner is reading his/her materials before a tutorial session starts. Table 1c indicates whether or not students read their materials after each tutorial session.

Table 1a: Number of hours spent on each tutorial activity

Group	<1hours	1-2hours	>2hours	Ave. group Score
MT251(TS1)	5 (25%) [55%]	13 (65%) [60%]	2 (10%) [77%]	20 [60%]
MT251(TS2)	6 (30%) [43%]	12 (60%) [54%]	2 (10%) [31%]	20 [48%]
MT354 (TS1)	6 (30%) [70%]	14 (70%) [78%]	None	20 [76%]

Note: students score is given in the parentheses [] and percentage is given in the brackets ().

Table 1b: Reading their materials before a tutorial session starts

Group	Response Yes	Ave. Score	Response No	Ave. Score	Ave. group score
MT251(TS1)	8 (40%)	62%	12 (60%)	59%	20 [60%]
MT251(TS2)	12 (60%)	49%	8 (40%)	47%	20 [48%]
MT354 (TS1)	6(30%)	77%	14 (70%)	75%	20 [76%]

Note: students score is given in the parentheses [] and percentage is given in the brackets ().

Table 1c: Reading their solutions after each tutorial session ends

Group	Response Yes	Ave. Score	Response No	Ave. Score	Ave. group score
MT251(TS1)	7 (35%)	55%	13 (65%)	63%	20 [60%]
MT251(TS2)	13 (65%)	50%	7 (35%)	43%	20 [48%]
MT354 (TS1)	5 (25%)	75%	15 (75%)	76%	20 [76%]

Note: students score is given in the parentheses [] and percentage is given in the brackets ().

In Table 1a, 60% of the learners from the three groups (MT251 (TS1), MT251 (TS2) and MT354 (TS1)) spent one hour or more on their tutorial activities. The average score reported in each group was as follows: 60% for MT251 (TS1), 48% for MT 251 (TS 2) and 76% for MT354 (TS1) respectively. The table indicates that the number of hours spent on each level (group) was closely correlated to how well students performed thereafter. Learners who spent more than one hour scored higher than those who spent less than one hour on their tutorial activities. The table further shows that those who spent more than two hours scored much better than those who spent less than two hours. The trend is the same across each group except MT251, where there is an anomaly in which 10% of learners performed poorly even though they spent a considerable amount of time on their tasks. This implies that there were few struggling students in this group that needed special attention. The table strongly indicates that the number of hours spent on doing their tutorial activities positively relates to the learners' average score, hence their overall performance.

Table 1b shows that 40% of MT251 (TS1) and 30% of MT354 (TS1) responded 'yes' in reading their tutorial activity before the session started. Interestingly, MT251 (TS2) performed very positively at 65%, but their average score was below half of the total overall score. This may suggest that even though they responded positively and spent extra time on reading their solutions after, it did not impact their overall performance. This links to the observations stated above regarding the anomaly in Table 1a. In addition, it indicates that peer tutorials, remedial, tutorials size, and so forth, could be factors that are lacking in tutorials and may require more attention and time. The table also shows that those who responded 'yes' received better average scores compared to those who responded 'no' for all the groups. Table 1b implies that reading their materials before the tutorial session relates to average score and overall performance.

The results in Table 1c are mixed. It shows that MT251 (TS1) and MT354 (TS1) have higher averages when the responses were 'no'. This is in contrast to MT 251 (TS2). The possible reason for these mixed responses is explained in the preceding paragraphs. Further, the response reported in Table 1c is opposite to the results given in Table 1b above. There is no clear trend that can tell us whether reading the materials after a tutorial session affects the learners' overall performance.

Factors that Prevent Learners from doing their Tutorial Activities

In addition to the responses, the learners were asked what factors they believe are preventing them from doing their tutorial activities. They were given various options to choose from, including: no space to study, no access to library material, no internet access, unavailable tutors, idleness, and others. The result of their responses is given in Table 2.

Table 2: Learners responses on factors that preventing them from doing their tutorial activities

Group	No space to study	No access to library material	No access to Internet	Tutor not available	Idleness	Others
MT251(TS1)	8(40%)	3(15%)	0(0%)	2(10%)	5(25%)	4(20%)
MT251(TS2)	8(40%)	5(25%)	3(15%)	2(10%)	5(25%)	4(20%)
MT354 (TS1)	7(35%)	1(5%)	4(20%)	0(0%)	5(25%)	6(30%)

In Table 2 we combined all three groups and identified their common trends. From Table 2, it can be seen that about 35%-40% of the learners chose 'no space to study' as preventing them from doing their given tasks. This was followed by 'idleness and others' at 20%-30%, and 25% respectively across all the other groups. Those who responded with the latter (30%) are part-time year 3 learners, most of whom are in-service and teach in various schools in the capital city. They mentioned teaching as a preventing factor. Year 2 learners did not specifically write their reasons for stating 'others', and this requires further investigation. 'Tutor not available' and 'no access to internet', on the other hand, were factors that had the least impact on preventing students from doing their tutorial activities.

Discussion

In this section, we will discuss the findings of the research. We will first discuss how the number of hours a learner spent on doing a tutorial activity positively related to the learners' overall performance. Clearly, as the number of hours spent increases, the average score increases as well. Further, learners who have prior preparation before a tutorial session perform better. This was most clearly demonstrated by the group TS2, wherein a higher percentage of learners who responded positively gained higher average scores. However, reading their tutorial notes after a tutorial session did not show a clear pattern. Although the other two groups support reading after a tutorial, it did not appear to relate to their performance.

Secondly, there are some areas that need improvement in the University, as indicated by the learners' responses. This implies that the University must invest more resources to build more study spaces if it is serious about generating quality graduates. Next, it must motivate learners to do their tutorial activities. It is no surprise that we found the lack of internet access as one of the hindrance factors in the study. This is due to the fact that there is no computer laboratory available on campus and most students have never had this service available to them. We note that few year 3 and year 2 (MT 251(TS1)) students chose internet access as a factor. This is because most of them are in-service learners who have access to internet via their offices. We suggest further research on other campuses of this University where they

have computer laboratories. The University is, however, in the process of setting up a computer laboratory on this campus, and this may alter future learners' perspectives and consequently their responses.

Recommendations

After discussing and analyzing the results, the following recommendations are put forward for future actions and/or research.

- The University should provide more study spaces, and motivate learners by using mentors, and provide flexible time-tables.
- Future research should be carried out during learners' time, as their second teaching subject or second major (TS2). The result indicates that this group has a lower group average. That is, their average is below the University's minimum pass mark.

Research Limitations

The following are the research limitations that need to be considered for future research:

- a) add a variety of responses into the instrument relating to motivation, participation, and attendance, to capture and reflect the learners' experiences better.
- b) use statistical tests such as correlation and/or ANOVA to test for significance on the response variables.

Conclusion

We have found that the poor performance of a learner in the study context appears to coincide with little time being spent doing a tutorial activity and less preparation before a tutorial session starts. Interestingly, there was no clear pattern observed between reading the material after tutorial sessions and the learners' results. There were a few anomalies and inconsistencies in the MT251 (TS2) results compared with the other two groups. This may in some way be related to the group's poor performance, which puts them under the University's minimum pass mark. This group took Mathematics as their second teaching subject (second major). It would be interesting to find out the causes of their poor performance. The results showed clear differences between the performance of the three groups studied; MT251 (TS2) learners performed poorly, MT251 (TS1) fell in the middle, and MT354 (TS1) did the best amongst the three groups in their responses to the tutorial activities. The result further reveals that having no space to study on campus and personal idleness are the two main factors that learners reported prevented them from doing their tutorial activities. Therefore, we suggest that the University should provide more study spaces, employ mentors, and have flexible time-tables as a way to address this problem.

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School-Based Assessment of Physics Concepts in Science Education: A Solomon Islands Case Study

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Abstract

This paper presents findings from investigating both trainee and practicing science teacher views and experiences of the School-based Assessment (SBA) of Physics concepts in the Solomon Islands. During May and June of 2015, 124 surveys, seven individual semi-structured interviews with practicing Science teachers and a focus group interview with seven trainee Science teachers was conducted. Survey data was analysed statistically while interviews were analysed thematically and results were then triangulated. Findings indicated high Cronbach alpha reliability scores for participants' views and experiences about teaching, learning, and assessment in general. Most participants indicated that they agreed with the use of SBA for multiple purposes but indicated some constraints with time, large class sizes, and lack of resources. Findings also suggest that both training and practicing Science teachers have some knowledge and understanding of physics concepts, however greater content and pragmatic knowledge and understanding to avoid misconceptions is very much required. Hence, a more coherent Physics content based approach to (pedagogical content knowledge) PCK is recommended for teacher training and ongoing professional learning.

Introduction

Science education in the Solomon Islands aims to develop science literacy which encompasses the notion that learners should be prepared for further studies as well as for everyday life after secondary education (Ministry of Education and Human Resources Development, [MEHRD], 2007). The aim is to provide quality Science education for life-long learning. This aim is consistent with the overarching goal to shift from objective-based education to outcomes-based education (OBE) in the Solomon Islands.

One of the key aspects in improving the quality of education in Pacific Island nations is to refocus on assessment strategies in schools (Fasi, 2005). SBA is one of the assessment strategies promoted by the Secretariat of the Pacific Board for Educational Assessment (SPBEA). The SBA can be used for multiple assessment purposes (Fasi, 2005). It can be used for assessment of learning (summative purpose) and assessment for learning (formative purpose) (Bell, 2007). The OBE in the Solomon Islands placed more emphasis on pragmatic teaching methods and SBA (MEHRD, 2011).

In Solomon Islands Science SBA is mainly for summative purposes. Specifically, to assess the procedural skills in Science which are difficult to assess in written examinations (MEHRD, 2008). Skills include as observations, following instructions, collecting, recording and communicating data, interpreting and responding correctly to data as well as drawing valid conclusions (MEHRD, 2010). However, findings from a study by Kakai (2010) in the Solomon Islands indicated that practical assessment activities in the SBA for the Solomon Islands School Certificate (SISC) are designed so that learners are mainly assessed on their written understanding of concepts more than procedural skills. Kakai (2010) suggested that SBA for the SISC can be utilised for the dual purposes of continuous summative and formative assessments as promoted by the SPBEA. For formative purposes, SBA is an avenue whereby assessment for learning can take place as well.

This paper suggests ways to enhance Science teachers' capacity and capability to achieve the intended outcomes through the teaching, learning and assessment process. Most participants agreed with the use of SBA for multiple purposes but indicated constraints due to time, large class sizes and lack of resources. Findings also suggest that both trainees and practicing Science teachers have some knowledge and understanding of Physics concepts, however greater content and pragmatic knowledge and understanding to avoid misconceptions is very much required. Hence, a more coherent Physics content based approach to PCK is recommended for teacher training and ongoing professional learning.

The Challenge

This study focused more on enhancing Science teachers' PCK. Other studies indicate that Science teachers' PCK is a pivotal factor in carrying out effective teaching, learning and assessment (Shulman, 1986; Moreland, Jones & Cowie, 2006). Besides, learners must trust their teachers as the experts when providing effective feedback and feed-forward (Cowie, 2000). A study conducted by Rodie (2011) in the Solomon Islands indicated that many beginning secondary teachers were not adequately prepared for some aspect of their teaching roles. She found that while they were not well prepared to teach, they were also placed in difficult classroom environments. For instance, there was a "general lack of teaching resources, crowded classrooms, and lack of specialised classroom facilities and equipment for subjects such as Science" (p. iv). In addition, there were limited assessment policies, systems and methods available for teachers to carry out effective assessments for multiple purposes (Walani, 2009). Even experienced practicing Science teachers have difficulty in such an environment (Kakai, 2010). Given such a difficult environment, science teachers' PCK is pivotal in finding improvised ways to make teaching, learning, and assessment effective in the classroom (Shulman, 1986).

One challenging factor was that not all Science teachers have similar teacher training or ongoing professional learning. On one hand, although some Science teachers have appropriate subject content knowledge, they may lack pedagogical knowledge with insights to teach and assess concepts, skills, and other affective aspects of learning. For example, after teaching for 14 years, Hoban (2002) admitted that, although he knew the subject content, there was an awakening to the complexity of learning underpinned by learning theories. He admitted that there was a contradiction between his teaching approach and what the learning theories imply about how learners learn.

On the other hand, some Science teachers who graduate from institutions that focus more on pedagogy may have less subject content knowledge to teach science at secondary school level. Kasanda (2008) found that Namibia Science teachers lack the content knowledge because of their teacher training background. A study conducted by Isak and Mohamed (2008) with Malaysian Physics teachers have similar findings. Besides, Saleh (2011) found that even third year Bachelor of Science Education learners in Malaysia who were about to teach Science, have the same level of Newtonian Physics conceptual understanding as their Form four Science learners. In the Solomon Islands, the Bachelor of Teaching program at the Solomon Islands National University (SINU) focuses more on classroom pedagogy. As such, this study also explored the perceptions of the training Science teachers at the SINU.

Furthermore, like other developing economies Solomon Islands has a large number of untrained teachers who may lack both the content and pedagogical knowledge (MEHRD, 2007). This is a challenge not only for the Solomon Islands but other Pacific island nations as well (Pacific Islands Forum Secretariat [PIFS], 2009). Teachers should be seen as trusted experts with in-depth PCK (Cowie 2000).

Theoretical Framework

Van den Akker (1998) discussed a concept associated with the gap between curriculum ideals and outcomes. Based on his longitudinal review on different curriculum waves of reforms in many different countries, Van den Akker (1998) summarised and highlighted the distinctions between various curriculum representations. He distinguished and termed the curriculum representations in order as a process from: ideal curriculum to formal curriculum, perceived curriculum, operational curriculum, experiential curriculum and finally attained curriculum. The first two curriculum representations, *ideal and formal* comprised of the guiding philosophy, rational and mission along with the documents that underlie and further elaborated the curriculum vision and intentions. The main stakeholders here are the curriculum designers. The last two curriculum representations, *experiential and attained*, represented what the learners actually experience during their learning and the “resulting learning outcomes” (Van den Akker, 1998, p. 422). Learners are the main subjects here. The theoretical basis for this study lies within the two central curriculum representations. These are the *perceived and operational* curriculum which represented teachers’ perceptions and interpretations of the curriculum, as well as their “actual instructional process in the classroom” (p. 422). The main stakeholders here are the teachers.

Perceived and operational curricula are pivotal to this study since they are regarded as the crucial connection in the process between the ideal curriculum and the attained curriculum. According to Shulman (1986) perceived and operational curriculum can be enhanced by improving teachers’ PCK. Morine-Dersheimer and Kent (1999) summarised Shulman’s concept of PCK as the combination of: pedagogical, assessment, content, curriculum and context knowledge, as well as knowledge about learners learning and understanding.

The Purpose

This study sought to explore and document the views and experiences of trainee and practicing Science teachers in the Solomon Islands. Particularly to investigate the level of their PCK in teaching, learning, and assessment of Physics concepts for use in SBA of practical assessment activities. This was the baseline to identify what was lacking and required in order to formulate a set of guidelines to improve teaching, learning, and assessment within the context of SBA for multiple purposes.

Research Design

Bounded by the phenomenon itself and selected participants based on geographical convenience, this case study employed a mixed methods design using both the quantitative and qualitative approaches (Yin, 2002; Cohen, Manion & Morrison, 2007). The two approaches were employed as a “triangulation mixed methods design” (Creswell, 2008, p 557). As such, data from both approaches were collected in any order, which ever came first. This mixed method approach was favoured since both data were independently collected but were complementary (Creswell, 2012) and were used for triangulation (Yin, 2002); that is using different methods to generate and to validate data for the same phenomenon.

The study administered two very similar surveys, each consisted of five scales and 54 items. Statements in the first four scales had five Likert choices: Strongly Disagree, Disagree, Uncertain, Agree and Strongly Agree. The fifth scale had four Newtonian Force Concept problems each with five multiple choices. Table 1 below provided a summary outline of the scales, number of items and responses required to be indicated by encircling a choice.

Table 1: A summary outline for the number of items in each scale

Items	Scales	SD	D	UN	A	SA
15	Knowledge of Teaching	SD	D	UN	A	SA
12	Knowledge of Learner's Understanding	SD	D	UN	A	SA
13	Knowledge of Content and Purpose	SD	D	UN	A	SA
10	Pedagogical Content Knowledge	SD	D	UN	A	SA
4	Knowledge of Newtonian Force Concept	A	B	C	D	E

One survey was administered to 60 practicing Science teachers from 22 high schools in Honiara and two from Malaita, Solomon Islands. The other survey was administered to 64 trainee Science teachers at the SINU. These two data sets generated a general picture of the phenomenon by providing comparisons and relationships between variables with statistical representations (Creswell, 2012). Complementary to that, qualitative data was collected using face to face individual in-depth interviews with seven practicing Science teachers and a focus group interview with seven trainee Science teachers. The interview schedules consisted of 16 semi-structured questions which were related to the statements in the surveys. The interviews were conducted with strict ethical considerations and informed consent. The qualitative data generated detailed and in-depth explanations with rich descriptions that were triangulated with the survey responses (Cohen, Manion & Morrison, 2007). Consequently, one type of data complemented any shortfalls of the other.

The raw quantitative data from survey responses was entered and tabulated using Microsoft Excel software and later the spreadsheets were converted to SPSS files for statistical analysis. The qualitative data, in the form of audio recorded conversations, were transcribed and translated into English. Then a back translation was also conducted to verify the data record. The transcripts were typed as Microsoft word documents. Later themes corresponding to survey scales and research questions were generated from the transcripts.

Findings

This section of the paper presents the Cronbach Alpha reliability scores for the survey responses and triangulation of the data with related interview responses. The Cronbach alpha reliability for the first four scales was > 0.60 . This indicates that most participants responded in a similar way to each statement. However, the Cronbach Alpha reliability for the Newtonian force concepts in the fifth scale is 0.35. This indicated that the responses were scattered and there was no consistency.

Table 4 shows the frequency of responses in scale five. The shaded cells are frequencies of responses which indicated the correct concepts. Excluding item 51, the majority of responses for items 52, 53, 54 were misconceptions. As a sample, item 54 is presented in Table 5 below.

A summary of the Cronbach Alpha reliability for each scale is also presented in Table 2. Table 3 depicts a sample statement from each scale and the frequency of choices, which indicated high consistency in the responses.

Table 2: The Cronbach Alpha for each scale in the survey

Scales	Cronbach Alpha
1 Knowledge of Teaching	0.72
2 Knowledge of Learner's Understanding	0.66
3 Knowledge of Content and Purpose	0.83
4 Pedagogical Content Knowledge	0.89
5 Knowledge of Newtonian Force Concept	0.35

Table 3: Sample statements from each scale with majority of responses indicating Agree

	Statements	SD	D	UN	A	SA
S1	I am confident in using familiar everyday examples to explain physics concepts.	2	1	22	66	33
S2	In my teaching, I use knowledge of learners' preconceptions of physics concepts.	2	11	30	64	17
S3	In my physics teaching, I can use the knowledge of how physics theories or principles have been developed.	0	5	16	69	34
S4	I use school-based assessment for both summative and formative assessments.	0	9	11	68	36

Table 4: Majority of responses were misconceptions as indicated in the unshaded cells

Item	Newtonian Force Concepts	A	B	C	D	E
51	Free falling objects	14	14	56	23	16
52	First law of motion	13	21	26	53	10
53	Friction	62	29	26	3	3
54	Third law of motion	78	7	6	5	27

Table 5: Sample - Item 54; indicating the frequency of responses to Newtonian force concepts. Only 21 responses were correct

Imagine a head-on collision between a large truck and a small compact car. <i>f</i>		
During the collision:		
A	The truck exerts a greater amount of force on the car than the car exerts on the truck.	78
B	The car exerts a greater amount of force on the truck than the truck exerts on the car.	7
C	Neither exerts a force on the other, the car gets smashed simply because it gets in the way of the truck.	6
D	The truck exerts a force on the car but the car does not exert a force on the truck.	5
E	The truck exerts the same amount of force on the car as the car exerts on the truck.	21

Discussion

This study sought to explore Science teachers' PCK in teaching, learning, and assessment of Physics concepts for use in the SBA of practical assessment activities. The findings from this study suggest that many participants can recognise learners' preconceptions and use them to develop conceptual learning. However, views and experiences about formative assessment which encompasses effective scaffolding were not fully expressed. Findings also indicate that continuous summative assessment was often regarded as formative assessments. According to Bell (2007), this form of continuous summative assessment is a weak formative assessment. Teachers need to enhance their knowledge and ability to provide scaffolding as well. Scaffolding was rarely suggested and expressed as an experience qualitatively, although in the survey many indicated that they can use multiple representations for teaching Physics concepts.

While findings suggest that SBA is an important continuous summative assessment, views and experiences about the validity and reliability were not well indicated. For summative purposes, validity and reliability may overlap (Black & William, 2006). According to Stobart (2006) the validity of summative assessment is embedded in the notion of "fitness for purpose" (p. 34). That is, whether the assessment is assessing what it is intended to assess. Harlen (2005) argued

that assessment activities should be constructed in a way that allows learners to demonstrate what they are assessed for. For instance, if the assessment is to assess skills then the activity should be designed in a way that learners will be able to demonstrate those skills. Moreover, the assessment activities and instructions according to Green and Johnson (2010) should be familiar to both learners and teachers. As such, similar activities should have been used during the teaching and learning process. Findings suggest that SBA was regarded as a one off activity for learners to be assessed for both practical skills and conceptual understanding. Due to time limitations, large class sizes and lack of resources, findings indicate that practical activities cannot be done frequently in the sample school settings. In addition, the notion of fitness for purpose was not well expressed or conceptualised.

Findings indicate that physical constraints and lack of PCK are inhibiting factors on the reliability of SBA. In the Solomon Islands SBA is administered by different teachers and learners at different schools at various times. Seemingly, reliability is a challenge (Brookhart & Nitko, 2008). Green and Johnson (2010) suggested that reliability can be maximised when assessment rubrics and learning outcomes are clearly presented beforehand to both learners and teachers. Besides, it is important for markers to have comparative understanding, knowledge and skills in the content and context of the assessment activities (Green & Johnson, 2010). Further to this, Black and William (2006) argued that learners should be allowed to perform similar assessment activities at different times to maximise consistency by gauging their true performance. Experiencing similar Science activities many times can be an avenue for learner enculturation into Science as well (Hodson, 1998). Findings indicate high consistency with the views relating to the importance of learners' familiarity with practical skills and theory. However, this research also suggests that uniformity, commitment and confidence of teachers to conduct SBA to assess skills and concepts are lacking. Hence, reliability of SBA is a challenge that needs to be addressed.

Conclusion

Findings from this study have indicated acceptable Cronbach Alpha reliability for most participants' views and experiences about teaching, learning, and assessment in general. The exception was for the content knowledge scale which had a low Cronbach Alpha reliability. This demonstrates the divergence of opinion and content knowledge. Most participants indicated that they agree with the use of SBA for multiple purposes but indicated some constraints with time, large class sizes, and lack of resources. However, it is important to stress that with SBA, teaching, learning and both formative and summative assessment should be seen as an integrated and on-going process.

The prescribed Physics concepts in the SBA can be taught and learnt by using formative assessments while conducting similar practical activities at different times. This will also help learners and teachers to be familiar with instructions, learning outcomes, instruments and what is intended to be taught, learnt, and assessed. In addition, findings from this study suggest that both trainee and practicing Science teachers have some knowledge and understanding of Physics concepts, however greater content and pragmatic knowledge and understanding to avoid misconceptions is very much required. Hence, a more coherent Physics content based approach to PCK is recommended for teacher training and ongoing professional learning of teachers in the Solomon Islands.

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Teaching and Learning for the 21st century: An exploratory examination of effective research-based Practices in Science Education

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Abstract

Today, education has expanded so much as to include multiple means of disseminating knowledge. This research-based study unveils a world of strategies in educational reforms for teachers to use as a way of providing knowledge in school. The main part of the study involved a review of content-based literature to investigate educational reforms in teaching and learning strategies. A small group of participants was also included to provide a portion of the paper. The findings will help teachers understand what science means and the different fields or branches in Science education, but its main focus is on teaching and assessment strategies that have been researched and proved effective and appropriate for education in the 21st century. Teachers need to develop and improve students' life-long learning skills. They are required to help students who are at risk in their Science and school subjects do better. As such, this paper advocates the shift from teacher-centered instruction to student-centered instruction that encourages inquiry and problem-based learning strategies. Instead of being transmitters of knowledge, they would become facilitators whose job it is to assist, support, encourage, advise and guide students as they are actively involved in science projects and academic activities. An appeal is made not only to Science teachers but also to every classroom teacher, to adopt teaching strategies that give students maximum opportunities to investigate, solve problems, make informed decisions, become critical thinkers and are responsible for their own learning.

Introduction

The study is restricted to recent and connected studies surrounding the main body of teaching and learning strategies for education in the 21st century. Research-based practices are strongly recommended for teaching and learning sciences because they contain evidences that have been obtained from real experiences and experiments. Quality performance in education depends on the effectiveness of strategies that are used in teaching and learning. The literature-based research undertaken is limited to two of the so-called strategies. These are inquiry-based (IBL) and problem-based learning (PBL) strategies. The review did not consider specific levels at which the Sciences are taught and learned; instead it studied the effectiveness and challenges of IBL and PBL. The paper begins with meanings of science and the various fields into which all sciences are classified. The importance of educational reforms in teaching and learning strategies is also discussed. Inquiry-based and Problem-based learning are discussed in depth and the paper concludes with a component in assessment.

Definitions - Science and Science Fields

Many people have tried to define 'science' in their own ways. According to Webster's New Collegial Dictionary, "... Science refers to a system of acquiring knowledge, a system that uses observation and experimentation to describe and explain natural phenomena". Sciences are generally classified into two major fields called, "Natural Sciences" and "Social Sciences". According to common online knowledge, the sciences or scientific disciplines are commonly divided into four groups: the natural sciences, social sciences, formal sciences and

applied sciences. However, the sciences are not only limited to the four main fields mentioned. Each field is prolonged by its sub branches or disciplines, thus forming the different kinds of Science subjects at school. Having a sound knowledge of Science disciplines and its content will enable teachers to become exemplary Science teachers. They need to be capable of using a wide variety of teaching and learning techniques in approaching their Science lessons. Science teachers need to accommodate proactive learning environments which will motivate students' interest in learning science and make them become successful. Research implies that the type of education intended to fulfill the demands of the past is no longer sufficient for the countless challenges and expectations confronting the 21st century students (Alberta Education, 2010; Barron & Darling-Hammond, 2008; Friesen & Jardine, 2009; Perkins, 2009).

Educational Reforms in Teaching and Learning Strategies

Contemporary learning settings need diverse methods of devising learning practices for learners and new approaches to teaching and assessment (Friesen 2013). Taken into consideration also, is the concern that students' performance in science subjects at school is at risk, on the grounds of teacher-centered teaching techniques. Moreover, in many countries, the demand for qualified technicians, scientists and engineers is rising. As reported by Diamond (2006), the "... research-based approach to enhancing science education will help to produce more scientific specialists at all levels, for a society that needs technicians as well as world-class researchers". As a result, the shift from passive transmission-based learning to active-based learning has been the focus in many educational reforms in countries worldwide.

Not many students take Science disciplines in upper secondary in the Vanuatu, perhaps because they appear optional but not compulsory in school subjects. Students also drop Sciences at school because lessons in those fields are not interesting and stimulating. Could this be due to the traditional teacher-centered instruction which sees teachers dominating learners in their learning? This is a familiar situation in Vanuatu and a study is needed to collect data that may provide implications for policy and decision-makers; and secondary schools in the country.

Providing learning situations that promote active learning is possible only in learner-centered situations. Today, education has expanded a lot through different ways of sharing and acquiring knowledge. For example, students may learn Science through different forms of media, online, in libraries, from books, in the communities, through projects and research besides learning in formal education. Therefore, teachers are no longer the only source and providers of knowledge. They need to identify and use approaches that stimulate and interest students in their learning and help them to acquire knowledge from other sources and environments, or meet the demands of our changing world.

The teacher-transmission-based and rote learning approaches lead to difficulties in trying to recall information for pen and paper examination questions. For example, in the traditional teacher-transmission-based situations, students are normally challenged with a large quantity of information to learn by heart. But because these things are not related to their experiences, they are not able to remember what they have learned. Also, whether those things will be useful when they are faced with tasks and problems they encounter in the world market is questionable. Students are not being prepared to work collaboratively with others when situations arise. In order for them to participate proactively, optimistic helpful settings that let students raise questions, articulate ideas and opinions, and receive assistance and support are

highly recommended. This is supported by Stepanek (2000) and Deboer (2002) who state that active learning techniques can enable students to make good decisions and take an active role in their diverse voices and reduce disciplinary problems. Researchers also assert that discipline-based approaches to inquiry learning, if designed well, will support students in deep learning (Bransford, Brown, & Cocking, 2000; Barron & Darling-Hammond, 2008; and Sawyer, 2006). Some of the strategies that promote active learning include case-based learning, project-based learning, a problem-solving approach, design-based, inquiry-based and problem-based learning. This paper focuses mainly on inquiry-based and problem-based learning which are discussed in detail in the next sections.

Inquiry-Based Learning (IBL)

Inquiry-based learning is the learning that occurs in situations where students are actively involved in unrestricted, learner-centered and practical activities. Embedded in the work of John Dewey, in inquiry-based learning, students are helped to devise problems which are connected to their prior experiences, and add new knowledge to their personal prior knowledge (Dewey (1938). Dewey believes that teachers should not convey information that is inactively captivated by learners, and that students must be vigorously involved in the learning process and be given a degree of control over what they are learning. Burrow (2000) adds that students develop their critical thinking abilities and scientific reasoning as well as developing a deeper understanding of Science when they practice inquiry. Other promoters of inquiry-based learning like Sawyer (2006), as well as Bransford, Brown and Cocking (2000) have also recommended an inquiry-based vision for education in the 21st century. This method of learning is highly commended for learner-centered situations. It can be used to teach Science concepts but can work equally well in subjects other than the Science disciplines. However, all users of the technique must be adequately trained in the methods that are involved in its implementation.

Methods in Inquiry-Based Learning

Inquiry teaching and learning methods are given a wide variety of explanations by different people. While some people have outlined three levels of methods, in contrast, Banchi and Bell (2008) outlined four levels which they believe will provide a very good guide to how to scaffold inquiry learning skills for the learners. Moving from their lowest level called confirmation-inquiry, the teachers' control and guidance is much more than that given at the next levels. At the next level which is the structured-inquiry, the amount of teacher's control is slightly reduced. At the guided-inquiry level which is level 3, the responsibility is left to the students for designing and following their own procedures to test their question. The teacher only helps, and leads and molds features of inquiry reasoning with individuals in small groups or with the whole class.

At level 4, students drive their own investigative questions. As the name implies, in open-inquiry (Student-Initiated Inquiry), students focus on all the features of inquiry. After that they present and explain their findings and results. Banchi and Bell (2008) affirm that in order for teachers to effectively develop their students' inquiry skills, they should start at the lower levels and work their way up to open inquiry. Open inquiry is the highest level and students will only be successful if they are interested and are provided with the skills to conduct their own research (Yoon, Joung &, Kim, (2012). This argument is fully supportive of maturity and age-levels. Therefore, for inquiry-based learning with immature students, enough practice must be provided in the first two levels, before gradually moving into guided

inquiry. When students are confident in working independently, they can be left to work at the Student-Initiated Inquiry level to acquire and build their knowledge or benefit from the activities.

Advantages of Inquiry-Based-Learning

There are many benefits to implementing inquiry-based learning. Harada & Yoshina (2004) stated that this type of learning develops more motivation in the students and encourages self-direction and develops interpersonal and team skills. Students are also helped to develop critical thinking skills. Research discoveries show that inquiry-based learning also results in better long-term preservation of information. IBL helps students become better learners by preparing them to become lifelong learners. According to Youthlearn (2007), "... inquiry-based learning helps develop deeper understanding of subjects and the growth of physical, emotion and cognition".

Furthermore, it promotes the inspiration that comes from within the students instead of incentives caused by outside factors. IBL provides privileges for students who do not succeed in traditional learning environments and enables them to be fully occupied in learning. It accentuates learning collaboratively and concentrates on student examples, knowledge and experiences (Youthlearn, 2007). Lastly, the process in IBL can be adapted for any age group. Pace and content can be adjusted to suit the learning needs of students.

Challenges of Inquiry-Based Learning

Despite upholding the advantages of IBL, we also have to consider the challenges we may face in using the approach. For example, the task of preparing teachers for inquiry teaching is a lot of work; teachers must also be trained to teach constructively and such a task needs time, resources, experts and funding. According to Anderson (2002), teachers need to learn new teaching roles and how to promote new forms of student work. Youthlearn (2007) adds that the teacher needs to learn how to release some of the control they would normally have over the learning as students move up the levels of IBL.

Another challenge is that IBL requires a lot of preparation time and planning which many teachers are not used to doing. Moreover, in IBL, content is normally overlooked as attention is rather directed towards process, thus causing a deficiency in content knowledge. The assessment component in IBL is another challenge. It can raise arguable issues because it is difficult to assess using traditional tests. Likewise, it is difficult to implement especially in low achieving classes. In order to meet these challenges, it is recommended that teachers to be trained in appropriate alternative assessment types.

Problem-Based Learning (PBL)

According to Maurer and Neuhold (2012), "... Problem-Based Learning is the constructivist response to traditional learning theories which is based on three main pre-requisites for successful and comprehensive learning process: 1) is student-centered, 2) follows an active process of knowledge construction, and 3) is collaborative". PBL is still regarded as an alternative way of teaching and learning.

Is problem-based learning the same thing as a problem-solving approach (PSA)? PBL is not the same as PSA, even if they are connected in some ways. For example, while PSA arrives

at a decision based on prior knowledge and reasoning, PBL is the process of acquiring new knowledge based on the recognition of a need to learn. In PSA, the teacher is the content expert in a teacher-centered context that promotes inactive learning and where the teacher directs learning activities. In contrast, in problem-based learning, the teacher is merely a guide or facilitator, and learning relies on the efforts of self-directed small groups. PBL creates a more active, student-centered learning context, as students decide what they need to learn (Mosefa, 2011). Davis, (2013) adds that in PBL, opportunities are provided for students to investigate and solve a real-world problem. The problem-based learning allows students to learn about concepts through the experiences of solving open-ended problems, so that students are learning both thinking strategies and content knowledge (Savery, 2006).

Methods in Problem-Based Learning

A simple PBL process would begin with the identification of a situation. The next step would be to analyze the situation. Step 3 is defining the problem and step 4 includes gathering and sharing the information. Step 5 involves refining the problem statement, and step 6 involves generating responses to the situation. Step 7 evaluates responses to situations, and in step 8 students reflect and evaluate their performance (Walden, (2011). How each step works requires further study.

Advantages of Problem-based Learning

According to Pawson, Fournier, Haight, Muniz, Trafford, and Vajoczki, (2006), "... PBL is a student-centered approach which students find more enjoyable and satisfying. It boosts greater understanding and develops lifelong learning skills. For teachers, PBL provides student incentives to attend classes, as the method yields more intrinsic rewards. Students are encouraged to spend more time studying. It promotes social interactions. For an institute, PBL makes student learning as a priority which may prove that the institution takes pride in teaching". As such, PBL is regarded as an aspect of IBL which also develops and prepares students for maturity in lifelong research skills, despite its related challenges.

Challenges in Problem-based Learning

A review of learning and instructional models shows some common challenges in implementation. For example, teacher-centered teaching and learning practices can be difficult to change, such as teachers changing from transmitting knowledge to situations where they are merely facilitators. Changing the mindset and attitudes of teachers who are used to the transmission-based models is another PBL challenge. Inexperienced teachers will have to be trained to use the problem-based learning model. Age-related limitations are also a challenge, whereby older students are more likely to accept and use PBL than the younger ones. According to Pawson et al., (2011), "... students' prior experiences do not prepare them well for PBL. PBL is time consuming and dominates study time for other subjects. Because learning is often messier, some anxiety is developed in the students and less content knowledge may be learned".

Assessment in Inquiry-Based and Problem-Based Learning in Science

This section gives inquiry-based and problem-based learning the honour of highlighting some types of authentic and alternative assessment which can best replace the traditional assessment types that often cannot work with them. Assessment is commonly thought of as

pen and paper tests however, assessment does not always have to include paper and pen. It can be a project, an observation, or an activity which shows that a student has learned the material (Preston, 2009).

Assessment in an inquiry-based project is ongoing. "Inquiry-based learning requires that students demonstrate their understanding through explanation, interpretation and application" (Harada & Yoshina, 2004). The skills that are assessed in inquiry learning cannot be measured by traditional tests, because "Assessment is focused on determining the progress of skills development in addition to content understanding." The types of assessment range from direct observation, checklists, informal checking, and conferencing, to rubrics that are completed throughout the project. Students looking at their peers' work and making suggestions is common and teachers helping students make changes in their progress is also familiar. Assessment is ongoing. Other forms of assessment include portfolios of students' writing, exhibitions, demonstrations, and interviews.

In problem-based learning, assessment is also central to learning because the purpose is to find out how learning is done and how best to achieve learning. Assessment therefore is a continuous process that drives instruction. It is important to consider assessment as an active demonstration of students' understanding and application of the understanding. At this point in time, I conclude that development and research are necessary to uncover alternative ways of providing data about students' learning. There is also a need for further research and development on how teachers can combine formative and summative assessment while using the best strategies in teaching and learning the Sciences.

Summary

Learning and teaching strategies, the curriculum and assessment, are all powerful instruments in shaping students' attitudes towards Science. This paper attempts to review what a body of research has provided on the best practices in Science education. The paper specifically addresses educational reforms in Science education. It discusses two of the best strategies that are student-centered and are highly recommended for teaching and learning the Sciences. The first, inquiry-based learning, is discussed in terms of its methods, advantages and challenges. Likewise, the problem-based learning approach is discussed in the same way. What Science is and the different fields of Science are used to introduce and set the background to the paper. Assessment is integral to teaching and learning, therefore a brief study on the right types of assessments for inquiry and problem-based learning environments is also provided. There is still much to learn in the theme and sub-topics chosen for this paper. Therefore, further and more accurate research is recommended to further this movement.

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Student voices: Experiences of Solomon Islands students in transition from primary to boarding secondary school

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Abstract

This study is about students' experiences when in transition from day primary schools to boarding secondary schools located away from their homes and villages in the Solomon Islands. In particular the study explored the positive and negative experiences of students who have left their parents to live in boarding schools. The study explored the strategies that these students used to overcome their difficulties and problems at boarding schools.

A cohort of 16 students and 4 principals were the study respondents. I chose 4 students from each boarding school, randomly selecting a male and a female student each from form one and form two. Each participant was interviewed, the responses transcribed, and coded for analysis.

The key findings revealed both positive and negative experiences; especially on first arrival at boarding school. The findings about the strategies students used to overcome their negative experiences are shared. Briefly, the positive experiences included feeling happy about seeing new students. Negative experiences included feeling homesick, lonely, shy and afraid. The strategies that students used to overcome these problems included creating friendships with other students and attending social activities.

The study found that the strategies provided by boarding secondary schools were not adequate. It was also found that the strategies were highly personalised to the students.

Keywords: student transition, boarding schools, Solomon Islands.

Introduction

My research is on the experiences of the Solomon Islands students when in transition from primary to boarding secondary schools. Most of the boarding secondary schools in the Solomon Islands are located far from the students' homes and villages, and students have to spend five months in school before visiting their parents for a month's holiday in June and in December.

There are three types of secondary schools in the Solomon Islands namely: National Secondary Schools, Provincial Secondary Schools, and Community High Schools. The top secondary schools are called the National Secondary Schools. They enroll the top students from all over the country with the highest marks obtained at the secondary school entrance examination at the end of primary education. They are all boarding schools except for one in Honiara, the capital of Solomon Islands, which allows 20% of its intake to be day scholars (Malasa, 2007; Sikua, 2002).

The next highly ranked schools are called Provincial Secondary Schools. They enroll the second best students mainly from their province after the selection of the best students to the National Secondary Schools (Malasa 2007; Sikua, 2002). All of the Provincial Secondary Schools are boarding schools except for Honiara High School.

The third level secondary schools are called the Community High Schools. They enroll the remaining students not taken by National and Provincial Secondary Schools. Most of the Community High Schools are part of primary schools and they mostly offer three years of secondary education. They are mostly day schools.

The Solomon Islands is made up of six main islands and many small scattered islands. The people are scattered across these many islands, comprising many diverse ethnic groups that have different cultures and languages. Narokobi (1989) stated that Solomon Islands is similar to Papua New Guinea in that it has diverse ethnic groups all within one racial classification of Melanesia, with a few Polynesian communities. Moreover, Knauft (1999) stated that “beyond its national and neo-colonial lineaments, Melanesia is justifiably renowned for being the most culturally and linguistically diverse region on earth” (p.1).

There are students who come from different islands and who have to travel for a couple of hours or even a full day to reach their boarding secondary schools. For those who come from the remote parts of the country it will take up to three or four days travel by boat to reach their schools. The students from the remote parts of the country will not have the chance to visit their parents during school holidays because of transport difficulties and they have to spend their school holidays at school or in Honiara with relatives. Ships usually go to their islands once every six months, so students find it difficult to go to their islands for June or December holidays. If they do and miss their transport back, they will have to repeat classes the following year.

Findings

The first year students were only three months at school when I carried out this research so they were in a transition period from primary school to boarding secondary schools. The second year students were already more than a year at boarding secondary schools, so they were reflecting on their transition. The principals were the top administrators of their schools and they knew the strategies to help best with the transition of the new students to their schools.

The themes that emerged from the students’ personal experiences include: negative experiences before leaving for boarding secondary schools, positive feelings on arriving, negative feelings on arriving, difficulties and problems encountered living at boarding school, and positive experiences of living at boarding school.

The themes that emerged from examining formal strategies that were available at boarding schools include creating good dormitories and classrooms, carrying out orientations, class assemblies, having dorm teachers and cultural groups.

Feelings on leaving for boarding school

The predominant feelings of the students on leaving their parents, homes, and villages for boarding at secondary schools were sadness and nervousness. The majority of the students who come from towns and villages that are quite far from their boarding secondary schools expressed only negative feelings of sadness when they were about to leave their parents. This does not reflect previous studies where students expressed both positive and negative feelings when they were about to leave primary schools for boarding secondary schools.

Only a few students whose homes and villages that were relatively nearby to their boarding secondary schools expressed both positive and negative feelings when they were about to leave their homes. This is supported by previous studies where students expressed both positive and negative feelings when they were about to leave for their boarding secondary schools (Anderson et. al, 2000; Brown & Armstrong, 1986; Cox & Kennedy, 2008; Galton & Wilcocks, 1983; Graham & Hill, 2003; Lucey & Reay, 2000; Measor & Woods, 1984; Mizeilie, 1999; Phelian et. al., 1984; Schaverien, 2004; Straciling & MacNeil, 2000; Ward, 2000; Zeedyk et. al., 2003).

While a number of studies have found that the students used various terms to describe how they felt at going to high school, feeling scared and nervous were the dominant terms (Johnstone, 2009). However for the Solomon Islanders in this study, feeling nervous is not a dominant term, but rather, feeling 'sad' was. This is possibly because of the situation of the boarding secondary schools in the Solomon Islands being physically located far from most students' homes and villages.

Positive feelings on arriving at boarding secondary school

The positive feelings of the students on arriving at boarding secondary schools include feeling 'happy' and feeling 'alright'. Some of the students felt happy when they finally arrived at the boarding secondary schools of their choice. They felt happy because they were accepted by the secondary school of their choice after having sat the Secondary School entrance examination and obtaining the pass marks for that secondary school. They felt they had finally arrived where they wanted to be. Others, however, felt happy to be in boarding schools because it gave them an opportunity to meet some of their friends and 'one-toks' (people who can speak the same dialects). They felt that they might not have had the chance to meet these people if they had not been accepted to that school. This is similar to the findings of Brown and Armstrong (1986) in secondary schools in UK, where some students expressed positive feelings when they initially arrived at secondary schools. However, the main difference is that almost half of the students in the UK study expressed positive feelings whereas only a few of those in the Solomon Islands boarding schools expressed positive feelings.

There are a few students who felt 'alright' when they arrived at their boarding secondary schools because they already knew some students who went to the same primary school with them. This finding is similar to Ganseson and Ehrich's (2009) study in Australia which showed that:

Knowing others from primary schools helps students feel safe and less nervous particularly in the early days and weeks in High School. When students see familiar faces amongst so unfamiliar faces, they feel more confident and able to cope in the new environment (p.68).

Furthermore, Weller (2007) argued that when children start a new school these connections of close friends from primary schools are important for them as they represent a shared past, common experiences, and similar anxieties between the students.

Negative feelings on arriving at a boarding secondary school

The negative feelings of the students when arriving at the boarding secondary schools include feeling homesick, lonely, shy and afraid. All of the female participants mentioned that they felt homesick when they arrived at boarding secondary school, but no male participants mentioned feeling homesick. This does not support previous studies which found that both males and females expressed homesickness (Brown & Armstrong, 1986; Pratt & George, 2005). Cultural factors may be a contributing factor here because girls tend to be very close to their parents in Melanesia. Furthermore, parents in the Solomon Islands are reluctant to allow girls to attend boarding schools because of what they see as social dangers. To them education or schooling becomes a means of taking students away from their communities. Often the result is that they find jobs and settle in urban areas permanently (Ministry of Education and Human Resources Development, 2004). In most cases, going to boarding secondary schools will be the first time that girls will actually leave their parents, a dis likely to be the reason for them reporting feeling homesick and thinking about their parents at school.

All the students studied felt 'lonely' when they arrived at boarding secondary school, but its degree depended on the number of people they knew at the school. If they had siblings, relatives, and friends at school, they did not feel as lonely as those who did not have any siblings, relatives, and friends at school.

This is similar to Pratt and George's (2005) study in the UK which found that some groups of first year students in secondary schools described their first term at secondary school as lonely and unsettling. However, the boarding secondary schools in the Solomon Islands are possibly different to those in many other countries because they are mostly located very far from most students' own homes and villages, and students have to live in these boarding secondary schools for 5 months before being able to visit their parents for a month's break in June, before returning to their boarding schools again for another 5 months of schooling.

Some of the students felt shyness until they had been in their boarding secondary schools for some time. They felt shy to go to the dining hall and classrooms where there were mixtures of students. Solomon Islands, as a Melanesian country, has a lot of ethnic groups that have many diverse cultures and languages. So, when the students come to live in a boarding school, they tend to feel shy when meeting other students. The Melanesian regions are the most culturally and linguistically diverse regions on earth (Friedlaender et.al., 2008; Knauft, 1999). Therefore, when the students come together in boarding secondary schools from different cultures and languages, students tend to feel 'shy' about meeting different students.

Some of the students expressed fear of other students, especially the senior ones. Naturally, young people may fear others who are bigger than themselves when they first meet them, and this was exactly what happened to some of the first year students of the Solomon Islands. This is similar to Mizeilie's (1999) study in the USA that in transitions both from elementary to middle school and from middle to high school, students had concerns about contact with older and rougher students.

The strategies to overcome negative feelings on arrival at boarding schools

The strategies that students used to overcome their negative feelings included creating new friendships with other students and attending social activities. The first strategy that students

used to overcome their difficulties and problems was creating friendship with other students. Students became happier and started to settle down at school when they started to know other students by making friendships in the first year. This is similar to the findings of Hertzong and Morgan (1998), who found that the most important area for students in making transitions to high school was developing close friends. Furthermore, students will start to feel secure at school when they start to make friends (Green, 1987), and their loneliness will begin to ease. There are students who wanted to return home but reported that finding friends at school encouraged them to remain in school. Younger students also wanted to make friends with older students because it was like a form of security for them to avoid bullying from other students.

The second strategy that students used to overcome their difficulties and problems was to be involved in school activities, sports, and mixing with other students. Some students mixed with students of different cultures and languages by telling stories with them, going for a walk, working together, playing together on the sport fields, and attending school activities and programmes together.

Some of the school activities are also enjoyable for some of the students. Therefore, following the same routine of school activities every week, where some activities are enjoyable, they finally get used to the life of their boarding school.

The strategies used by the boarding secondary schools in the Solomon Islands

Orientations

The programme of orientation for the first year students depends on each boarding school. For some schools, it will be one day orientation, whereas for other schools, it will be one week of orientation. During orientations, schools usually go through the school rules and school programmes, paying of school fees, and other requirements. For some schools, as part of school orientation, a get together meal is held for both staff and students, followed by a dance. This is similar to what McGee et.al. (2004) described about orientation activities in observed schools, saying that they can range from a single session on the first day of school to an ongoing programme lasting up to a full semester that involves students, teachers, and parents of both primary and secondary schools. However, in the Solomon Islands most parents and teachers of primary schools cannot be involved in transition programmes in boarding secondary schools because of distance.

Class assemblies

Class assemblies are used by a number of Solomon Islands schools to help in the transition process. The class teacher of each class helps the students to focus their minds on academic matters, vocational, and social guidance and health. On academic matters, class teachers will talk about how to study, explain assessment procedures, and help students make their own study time tables. This is consistent with Akos' (2002) findings that students' academic concerns indicate that it is important to build students' confidence in the classroom by teaching homework and study skills.

Dorm masters/mistresses

Schools assign teachers to oversee the dormitories. These teachers are responsible for the students in each dormitory. This result is similar to the findings in New Zealand, where teachers are assigned to each hostel. Like the situation in the Solomon Islands schools, dorm teachers are the ones who usually welcome the students into the hostels and encourage them to be supportive of one another (Kennedy at.al., 2002).

Cultural groups

The National Secondary Schools usually have cultural groups, according to the Provinces in Solomon Islands, to help with the transition of the students who are likely to be from all over the country. The bigger Provinces which have a lot of students in a school usually have more than one cultural group, divided into different regions of the Province, whereas smaller Provinces that usually have a smaller number of students and have one cultural group. The senior students in each cultural group will lead their own groups and they are the ones that usually help their new students from their own Provinces to settle down in school.

The Provincial and Community High Schools have cultural groups based on the districts or the regions in each Province, because their intakes are mostly from a single Province. Most of these schools have bush allotment sections. The intention of bush sections is for the students to make their own gardens, practice their own cultures and speak in their own dialects, usually in the weekends. This is the time that students will go and play, speak in their own dialects, and sing their own language songs.

Conclusion

The students' experiences when in transition from day primary schools to boarding secondary schools in Solomon Islands include both positive and negative feelings. The positive feelings include feeling 'happy' when they finally arrived at the boarding secondary schools of their choice and feeling 'alright' because they already knew some students from the same primary schools they went to.

The negative feelings when students were about to leave their homes for boarding secondary schools include feelings of 'sadness' and feeling 'nervous' about going to live in a boarding school. The negative feelings on arriving at boarding school include feeling 'homesick', 'lonely', 'shy' and 'afraid'.

The strategies used by students to overcome their negative feelings include creating new friendships with other students and attending social activities. The strategies used by schools include orientations, class assemblies, dorm teachers and cultural groups.

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Students' beliefs about learning mathematics: some findings from the Solomon Islands

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Abstract

Students' beliefs and attitudes can impact on their mathematics learning and performance. Yet, there appears to be minimal literature that deals with the educational implications of this dimension. In this study, a mixed method approach was used which combines quantitative and qualitative research techniques. Three methods of data generation used were: written survey, semi-structured interviews, and focus group interviews. Due to space limitations, only data from the written survey are considered in this paper. This paper focuses on the beliefs of Year 12 Solomon Islands students in mathematics learning. A total of 107 students participated in the study. Most of the students were 17 to 19 years old. The students' beliefs were analysed and themes identified. The study found that students have both negative and positive beliefs about learning mathematics. While most students were in agreement about the beliefs in doing mathematics, there were variations in the students' self-efficacy beliefs. The findings are interpreted in relation to recent writing about students' beliefs towards learning mathematics. These beliefs can play a vital role in mathematics classrooms. There needs to be an awareness of the impact of beliefs in the mathematics classroom. Mathematics teachers may need to review, reflect, and re-examine their teaching practices to seek new approaches to improving the teaching and learning of mathematics for the development of students' positive mathematical beliefs. The paper will consider the issues arising out of the study and offer suggestions for meeting these challenges.

Keywords: Beliefs, attitudes, mathematics learning, secondary school students, Solomon Islands, implications

Introduction

Mathematics educators (Leder & Grootenboer, 2005; White, Way, Perry, & Southwell, 2006) claim that students' beliefs shape their cognitive and affective elements in learning mathematics. Given the complex ways in which mathematical beliefs, attitudes, skills, and knowledge are intertwined, assessing students' beliefs and attitudes can provide valuable information. The results can be used to guide the development of a classroom environment conducive to growth in positive beliefs and attitudes and in addressing counterproductive beliefs (Tarmizi & Tarmizi, 2010; Whitin, 2007).

The importance of the affective domain in mathematics learning has led to calls for a greater emphasis on this dimension in curricular documents. The 'Principles and Standards for School Mathematics' (National Council of Teachers of Mathematics, 2000) document outlines a range of beliefs and attitudes about mathematics that contribute to productive problem solving and communication. Although the latest curriculum document in the Solomon Islands (Ministry of Education and Human Development, 2010) promotes the development of positive beliefs and attitudes, there is limited emphasis on this shortcoming.

The following research questions guided this study:

1. What beliefs and attitudes do selected senior high school students have towards their mathematics learning?
2. What factors do students think have impacted on their beliefs and attitudes towards learning

mathematics?

The data reported in this paper come from the above study (Kele, 2014) and address the first research question.

Literature review

Students' beliefs about learning mathematics may have a substantial impact on their interest and motivation in mathematics. These beliefs may be assumed to mean how students make sense of mathematics and how they perceive it in a social learning context.

Learning mathematics has been described as sense-making. Sense-making in learning involves constructing meaning, interpreting, reasoning and reflecting ideas from information provided by the teacher and the textbook. Understanding, perseverance, curiosity, confidence and flexible thinking are hallmarks of sense making (Whitin, 2007). In short, having a sound understanding of the concepts, content and processes is vital for making sense of mathematics.

There are key social processes involved in learning mathematics. Social-constructivists believe that learning often takes place in social interactions (Jones, Jones, & Vermette, 2010) in which students actively construct their own mathematical knowledge (Lau, Sing, & Hwa 2009). In developing students' mathematical knowledge, it is likely that the teacher and students are part of shared learning to communicate mathematical ideas (Blankstein, 2012). Students' learning of mathematics occurring during social interactions can promote positive beliefs. Students' beliefs about learning mathematics as a social process was illustrated by Young-Loveridge and Mills' (2010) study. The findings from one of the statements from the questionnaire: I talk about my ideas in mathematics in a group or with a partner, revealed that the majority of students (84%) reported that they communicated their mathematical ideas in-group or with their peer(s). The authors affirmed that students had positive views about sharing mathematical ideas with other people. Students recognised that their involvement in small group discussions with other students helped develop their mathematical thinking.

Method

Three methods of data generation were used in this study: written survey, semi-structured interviews, and focus group interviews. Due to space limitations, only data from the written survey are considered in this paper.

Participants

This research was conducted with Year 12 senior students in two Solomon Islands high schools. One of the reasons for selecting Year 12 for the study was that Year 12 is the best representative of a secondary level as this is the last level in the secondary school. The researcher could explore the general tendency of secondary students' beliefs towards learning mathematics by engaging them in the study before they ventured into tertiary level. The research was conducted in one urban and one rural school. A total of 107 students participated in the study. Of 107 students, 55 students (21 girls and 34 boys) were from the urban high school and 52 students (25 girls and 27 boys) were from the rural high school. Most of the students were 17 to 19 years old.

Data collection procedure

To investigate students' beliefs towards learning mathematics, a written survey was administered to all students in the study. It was structured with a variety of questions on a four-point Likert Scale; strongly disagree (SD), disagree (D), agree (A) and strongly agree (SD). This written survey consisted of two parts. In part A, there were 21 closed belief statements which are discussed below.

Results and discussion

During the analysis process, effort was made to organize all belief statements into some specific categories to configure a type of belief that referred to a particular statement. The following four belief categories with the number of statements in the survey tool are outlined in Table 1.

Table 1: Category name and number of statements for each belief category

	Belief category	Number of statements
A	Students' beliefs about doing and knowing mathematics	7
B	Students' beliefs about the utility of studying Mathematics	3
C	Student's beliefs about gender differences	1
D	Students' beliefs about their self-efficacy	10

According to Table 1, category A incorporated seven statements (4, 6, 7, 8, 9, 11 & 20) attributing to *students' beliefs about doing and knowing mathematics*. In category B, there are three statements (13, 14 & 15) grouped under *students' beliefs about the utility of studying Mathematics* at school. These are statements that refer to students perceptions of mathematics which could influence their life during their time at school. Only a single statement (16) was categorized under *gender differences* in category C. This particular statement tries to solicit students' view regarding gender differences in learning mathematics. In category D, 10 statements are grouped as *students' beliefs about their self-efficacy in learning mathematics*. This category incorporated statements regarding students' beliefs in their confidence, ability, and effort required of doing mathematics.

Students' beliefs about doing and knowing mathematics

The data for this category (see Table 2) revealed students' positive responses towards knowing and doing mathematics. This was indicated by the percentage of agreement in their responses to the statements. The difference between the genders is shown in italics.

For the highest levels of agreement in Table 2, all boys agreed that doing mathematics required working logically in a step-by-step fashion (100%, statement 4), while just 98 % of the girls took this view. All boys believed that learning mathematics was a social process, where they could share mathematics ideas with other pupils (100%, statement 20), and about 98% of the girls had that view. Moreover, nearly all boys believed that when working on mathematics problems their answers must be sensible (95%, statement 9), and 93% of the girls agreed. Doing mathematics allows room for original thinking and creativity was supported (statement 6) by 98% boys and 87% of the girls. More boys (92%) than girls (83%) thought that knowing why an answer is correct is as important as getting the correct answer (statement 8).

As shown in the written survey results, for example, 100% of the students believed that learning mathematics required working logically in a step-by-step fashion (statement 4). Students' beliefs in this study align with data from a recent study (Francisco, 2013) where students identified learning mathematics as a matter of knowing the right procedures, and being able to apply rules accurately. The finding implies that students perceived doing mathematics as involving more procedural than conceptual understanding (Kloosterman, 2002).

Table 2: Category A: Doing and knowing mathematics

Statement	Overall (%)				A or SA (%)		Diff
	SD	D	A	SA	Boys n=61	Girls n=46	
4. Doing mathematics is usually a matter of working logically in a step-by-step fashion			43	57	100	98	2
6. Doing mathematics allows room for original thinking and creativity		4	50	46	98	87	11
7. It is okay for learners to come up with their own ways of solving mathematics problems.	6	17	53	24	72	85	13
8. Knowing why an answer is correct in mathematics is just as important as getting the right answer.	1	6	57	36	92	83	9
9. When working on mathematics problem, it is important that your answer makes sense to you.	2	3	34	61	95	93	2
11. Learning mathematics involves more thinking than remembering	3	14	30	53	77	89	12
20. It is important to explain how I solved a problem to other pupil in class	1		47	52	100	98	2

Another major finding is that the majority of the students (99%) considered learning mathematics as a social process. They believed that sharing mathematical ideas with their peers or in their groups was part of the learning process. This finding is consistent with Lee and Johnston-Wilder (2013) who found that students like to work on mathematical ideas in groups.

Students' beliefs about the utility of studying Mathematics at school

Data in Table 3 present the percentages of students who agreed or disagreed with each statement, and the percentage of students who agreed in terms of gender.

Overall, the majority of boys (95%) and girls (87%) had similar beliefs that studying Mathematics at school helped them to think better (statement 13). Less than three-quarter of boys (62%) and girls (74%) agreed that their relative success in school depended on their mathematical proficiency. Students believed that studying Mathematics in school was important. It helped develop their cognitive thinking and ability.

Almost all boys (97%) and girls (91%) thought Mathematics as a subject was related to many jobs and careers. Moreover, they felt that mathematical knowledge was needed in many work places and to prepare them to cope with the real world challenges. With respect to mathematics and the future, it was interesting to see that the majority of students (96%) highly regarded the important role mathematics played in many jobs and careers. Students' beliefs are that mathematics is related to everyday experiences, and this is consistent with earlier findings (Beyers, 2011). The high agreement rate implies that many students were aware of the usefulness of studying Mathematics to solve problems in their everyday lives.

Table 3: Category B: Utility of studying Mathematics

Statement	Overall (%)				A or SA (%)		Diff
	SD	D	A	SA	Boys	Girls	
					n=61	n=46	
13. Mathematics helps me learn to think better.	1	7	35	58	95	87	8
14. Mathematics is needed for many jobs and careers.	2	2	44	52	97	91	6
15. To succeed in school, you need to be good in mathematics.	9	22	51	17	62	74	12

Students' beliefs about gender differences

Table 4: Category C: Gender differences

Statement	Overall (%)				A or SA (%)		Diff
	SD	D	A	SA	Boys	Girls	
					n=61	n=46	
16. Men are better at maths than women	40	38	11	9	23	20	3

The data in Table 4 shows that less than a quarter of students (n=21, 20%) agreed men are better in mathematics than women. Moreover, a slightly similar number of boys (23%) and girls (20%) agreed with this view. However, 78% had a disagreement about the statement. In addition, 40% of the students strongly disagreed. Among this group of students were 46 boys and 36 girls. Only one girl did not respond to this statement.

Students' beliefs about their self-efficacy

Table 5 presents the percentage of students who agreed or disagreed with each statement about self-efficacy in mathematics learning.

The data in Table 5 revealed that students had a high sense of self-efficacy towards learning mathematics. The majority of students (90%) agreed that mathematics was interesting and they had the kind of mind needed to do more advanced mathematics (statement 2). Interestingly, more boys (95%) than girls (78%) were interested in mathematics. While 90% of the students thought they never gave up even though mathematics was hard, 10% did not agree (statement 10). Students' beliefs of having confidence in order to be good at mathematics were rated highly by most students (98%, statement 17). About 92% agreed that they were capable of doing mathematics if they had a kind of mathematical mind (statement 21).

Three-quarters of the students (75%) agreed that they did not find mathematics difficult (statement 5). However, more than a quarter (26%) found mathematics difficult so they avoided it whenever possible. Similarly, more students (64%) believed that they were not poor at doing mathematics, while 36% believed they were poor at mathematics (statement 12).

Table 5: Category D: Self-efficacy

Statement	Overall (%)				A or SA		Diff
	SD	D	A	SA	Boys n=61	Girls n=46	
1. I am good at mathematics and I enjoy the challenge of it.	4	20	54	22	87	59	28
2. Learning mathematics is interesting. I have the kind of mind needed to do advance mathematics.	1	10	43	47	95	78	17
3. I feel okay about making mistakes in mathematics. While I am not especially strong at it, I am not fearful of it either	6	14	39	41	74	85	11
5. Maths is difficult for me so I avoid it whenever possible.	30	45	18	8	23	28	5
10. When my work in maths is hard I don't give up.	3	7	29	61	95	83	12
12. I am very poor at doing mathematics.	23	41	26	10	31	43	12
17. To be good at mathematics you need to have confidence you can do it.	2		24	74	98	93	5
18. To be good at mathematics, you need to remember formulas, procedures and rules.	1		18	81	100	98	2
19. To be good at mathematics you need to work hard at it.	1	5	19	76	95	96	1
21. To be good at mathematics you need to have a kind of "mathematical mind".	2	6	37	55	89	93	5

Students displayed high self-efficacy in their choices. For example, most of the students (75%) believed that mathematics was not difficult (Statement 5). Similar conclusions were drawn by Young-Loveridge and Mills (2010). Eighty one percent of the students in their study did not find mathematics difficult.

Most students (90%) believed they never gave up when encountering difficulty in mathematics (Statement 10). This belief suggests that students who feel self-efficacious are eager to persist longer on difficult tasks and learn more. Beghetto and Baxter (2012) stated that students who feel efficacious about their learning mathematics can see themselves doing well in mathematics lessons despite any difficulty encountered.

Those students who negatively responded to each statement in the written survey need to have their positive beliefs towards learning developed by facilitators. As noted by Beyers (2011), students' well-formed beliefs with respect to learning mathematics can influence not only their Mathematical subject thinking and performance but also their attitudes and decisions about mathematics in later years.

Limitations of the Study

To address the shortcomings in literature, this study set out to explore high school students' beliefs and attitudes towards their mathematics learning in the Solomon Islands context. A number of limitations were encountered in the process of conducting this study, some of these are outlined below.

A small sample size (n=107) was selected for the written survey. It is suggested that the sample size be increased to include students from a range of backgrounds. Additionally, more boys (n=61) than girls (n=46) participated in the written survey.

Due to time constraints, only two schools were chosen for this study. The study focused on Year 12 students hence represented students who had been successful in the Solomon Island context. What about the students who did not get this far? The research could be extended to other schools and levels to address these shortcomings.

The national language in the Solomon Islands is Pijin. Even though the survey questions were written in English and explained to students in Pijin, they may not have been well understood.

Implications of the Study

In spite of the above limitations, the findings provide valuable insights into students' beliefs regarding learning mathematics in general and as a school subject. The study has implications for teachers, teacher educators, and further research.

Teachers need to be sensitive to the possible effects of negative beliefs and attitudes in Mathematics learning. Through continuous reflection on their teaching practices and through ongoing dialogue with their students, teachers can maximise their power to positively influence students' learning and the lessons they teach. Students can be encouraged to make personal reflections on their beliefs and attitudes, anxiety, and performance when learning Mathematics. Examples could include using a log book or journaling. From time to time they could review their progress and make improvements where appropriate, and take necessary actions that foster effective and worthwhile learning of mathematics concepts and thinking.

The most critical person in any learning environment is the teacher. A number of researchers (Beswick, 2006; White et al, 2006) have highlighted the importance of teachers' own beliefs and attitudes towards mathematics. Teacher educators need to be aware of not only students' mathematical knowledge, but also how the understanding of their own beliefs and attitudes is likely to impact on their pedagogy when teaching the students. Student teachers need opportunities to review, reflect, and reexamine their own beliefs and attitudes towards mathematics learning. Teacher educators could use class discussions or statements such as those used in the current study to fuel inquiry into students' perspectives.

The participants in the study were from two schools, thus, the findings may or may not generalize to the population of secondary school students as a whole in the Solomon Islands. There is a need for more research with larger, more random samples with different backgrounds to determine how common these beliefs are in the general population.

This study only partially revealed gender differences in mathematics learning because the study only used one statement about gender difference in the written survey. Future research studies could have more statements, and then use interviews to explore this issue in more depth.

Ideally, it would have been good to make links between survey findings and what happened in classrooms. This could have been achieved by doing classroom observations, and by conversing with teachers, enabling the researcher to gain insights into why the students responded in particular ways. Although this was not possible in the present study because of time constraints, such research could throw further light on the issues raised here.

Conclusion

The study found that students have both negative and positive beliefs about learning mathematics. These beliefs can play a vital role in Mathematics classrooms. It is important to actually listen to student perspectives to understand what does or does not work for these students in terms of their mathematics learning. There needs to be an awareness of the impact of beliefs in the Mathematics classroom. Mathematics teachers may need to review, reflect, re-examine their teaching practices to seek new approaches to improve teaching and learning of Mathematics for the development of students' positive mathematical beliefs.

It is hoped that the findings reported in this paper will generate more interest in research with respect to students' beliefs about mathematics and the gender differences that may impact on student learning. Teachers, teacher educators and researchers need to work together to find better ways to help all students develop positive dispositions.

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Last hour assignment completion: A Solomon Islands case study

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Abstract

Assignments are a vital component of assessing students' learning, performance and achievement in higher education. At the School of Education and Humanities (SOEH) of the Solomon Islands National University (SINU), where teacher trainees are educated, assignment requirements apply. Students are expected to do assignment tasks satisfactorily to pass units studied. Teacher trainees are given tasks at the beginning of each semester to do and complete within four weeks. However, some do not usually write and complete assignments well before the due dates. Others complete assignments in the last hour. There are contributing reasons for such practice. These include course, assignment, and reading loads of students, and the inadequate or unavailable learning resources such as computers, study desks, and library support services. While last hour assignment completion seems common, literature on the topic is not widely available.

This paper looks at the issue of 'last hour completion' of assignments. Specifically, the paper examines the learning, performance and achievement effects of doing and submitting assignments in the last hour by teacher trainees at SINU. The paper is based on a case study of a cohort of SOEH students doing the Diploma in Teaching (Secondary), Diploma in Teaching (Early Childhood Education) and Bachelor in Teaching (Secondary). A prepared questionnaire was issued as a data collection method. Findings relating to the reasons for last hour assignment completion and the effects of this practice on learning, performance, and achievement are presented. Suggestions about ways to deal with last hour assignment completion are made.

Keywords: last hour assignment completion, teacher trainees, students' assignment

Introduction

The purpose of the paper is to bring to light some of the knowledge and experiences of tertiary students in Solomon Islands relating to how they approach written assignments. The paper used a prepared questionnaire to uncover the students' knowledge and experiences of completing assignments in the last hour, and the impacts this may pose on their learning, performance, and achievement. The two focus questions that guided the study were:

- (1) What are the participants' knowledge and experiences when assignments are completed in the last hour?
- (2) What are the participants' knowledge and experiences on the impacts of completing assignments in the last hour?

Methodology

A questionnaire with open-ended and closed questions was prepared and given to ten participants. The participants were selected on the basis of their availability in the target population at the time of the study and willingness to participate. A sample of ten participants was selected to represent the knowledge and experiences of the teacher trainees in the Solomon Islands on the issue of last hour assignment completion. The data were analysed using thematic analysis, where recurring themes that emerged from the data were identified.

Findings and discussion

On the question of students completing assignments in the last hour, the participants gave several reasons worth noting. These were the *lack of concentration, delaying the starting time to write assignments, poor time management, several assignments being due at the same time* and the *lack of adequate learning resources* to support them in their learning and assignment preparation.

Lack of concentration on the part of the trainee was a clear theme. Data from the study revealed that the lack of concentration has hampered some students, resulting in the completion of assignments in the last hour. There were several reasons attached to that lack of attentiveness. Some participants claimed that some students just deliberately did not want to give much attention to a particular assignment because the assignment was not easy. One participant said:

A contributing factor to completing an assignment in the last hour is due to the lack of concentration given to a particular assignment. This may happen because the assignment may be a bit difficult. (TSM06)

Some participants claimed that they have to honour responsibilities which were personal in nature that could not be possibly avoided. On that note a participant said:

Students ... have other commitments such as family chores that have to be honoured ... (TSM02)

The data revealed that some students could not concentrate on one thing at a time. Their attention seemed to wander, jumping from one thing to another.

With regards to married students, it is understandable that family commitments are difficult to ignore. In the Solomon Islands, families of some married students are left at home in the provinces while fathers or mothers are studying at the SOEH, SINU. This would make it difficult for the married students to ignore their family responsibilities. Their family commitments “keep(s) their family close and gives strength and comfort during difficult times” (Strachan, Akao, Kilavanwa, & Warsal, 2010, p. 71).

A second theme was the postponing of writing time. The time to start writing an assignment is an important matter to consider. Data collected from the study revealed that delaying or continually postponing the time to start writing an assignment is one contributing factor to the last hour completion of assignments. In Pidgin, a student may say, “*Bae mi duim tumoro*” (“I’ll do it tomorrow”). When tomorrow comes, no writing takes place until the student realises that the due date is fast approaching. Similarly, another participant sees delaying the writing and completing of an assignment as a thing that students cannot avoid, but also made a comment on the period given for assignments to be completed and submitted. He said:

The postponement of starting to write and complete an assignment is something that students cannot do away. This may be related to the time allocated to do the assignment. Some students see the four weeks given as too long. (TSM06)

The practice of delaying doing something, known as procrastination (Pitts & Bennett, 2011; Zarick & Stonebraker, 2009), is somewhat a common issue that students face (Grohol, 2005), and is considered a “bad habit” (Cyril, 2014, p. 39).

Related theme is that of time management. One compelling reason the participants gave was how well students managed their time in a day. One participant said:

Completing an assignment in the last hour is related to how students managed their time per day. If they give a fair amount of time for the tasks to be done, they should be accomplished on time. (TSF010)

Another participant shares the same sentiment and adds that time management is important in an academic institution. She said:

Some students cannot manage their time properly. It is my conviction that time is important in an academic institution. There must be time allocated to everything. (TSF07)

Time is often referred to as the “scarcest resource” (Alex 2009, cited in Cyril, 2014, p. 38). The findings in the study point to the fact that if students managed their time properly tasks including written assignments could be accomplished on time. It is the lack of managing it that affects students in their approach to the tasks needed to be done.

Another common theme was that trainees had multiple assignment due dates at the same time. In tertiary institutions, students often enroll in more than one course or unit per semester and they usually have assignment components in them which could be due on the same date. A participant has this to say on the issue:

One of the challenges in trying to cope with assignment due dates is that...there could three or four assignments that are due on the same date. For some students, they would not be able cope with the burden and pressure that are upon them. (TSF08)

Another participant has this to say on the same issue:

Sometimes I find it difficult to write and complete assignments when there are more than two assignments due on the same date and time. It is just too much for me. (TSM010)

When students are under pressure because three or four assignments are due on the same day, it is likely that they would face stress, anxiety and uneasy circumstances, causing them not to concentrate and manage their time properly to meet the same deadline for all the assignments.

An important theme is that of insufficient learning resources for preparation of assignments. To support learning through writing and completing assignments, learning resources are crucial for the students. Sadly, what emerged from the data was that learning resources such as computers and access to the internet were not adequately provided for students. This is what some participants claimed was a hindrance to completing assignments well before the due date. The following participants said:

For some of us, it is hard to find a computer to type assignments. We have to

borrow it from someone else, but if that someone also uses it, we have to wait until it is available. (TSF03)

Access to computers and the Internet are not available in the school. They are important to type and to search for relevant information for the assignment. (TSM07)

Resources such as computers and the Internet are not often available in the school where I am doing my studies. This hinders the progress of writing the assignments, thus completing it in the last hour often occurs. (TSM05)

Learning resources such as computers, printers, Internet, library support services and even desks and chairs for students to use are of crucial importance for students to do their studies and support them to search for information and to type and print assignments to be submitted as this is now the trend. If adequate learning resources are not provided, students could be put in a precarious situation. For example, officers of the library, the store house of knowledge and relevant information should be readily available all the time to assist the students for the information needed for assignments.

Impacts on students

The questionnaire then moved on to ask the participants the likely impacts of completing assignments in the last hour. The data collected showed some positive and negative impacts.

Positive impacts

The participants claimed that completing an assignment in the last hour is not at all bad. It is a time when students would focus more on the assignment, and thus giving all their time and effort to the assignment. It is also a time when students will be more invigorated to complete the assignment to the best of their abilities. On that note, a participant commented and said:

It gives me the courage and energy to really concentrate on writing something concrete for the assignment. (TSF010)

If an assignment is completed in the last hour, a student would be put under pressure, but some participants believe that working under pressure is to their advantage, helping them to quickly think what to write. It is also a time when there will be a flow of fresh ideas, as one participant claimed:

Completing an assignment in the last hour will create a flow of fresh of ideas as a result of being under pressure. (TSM06)

Negative impacts

Despite the participants' claims about the positive impacts of completing assignments in the last hour, some negative impacts have emerged from the data collected. For example, the work produced and submitted by a student is believed to probably be of low quality. This may happen because there is limited time available to do proper editing and proof reading given to the assignment. One participant says that:

It's more likely that there will be less time given to the assignment for editing and

proof reading purposes. More likely, there will be spelling errors and words missing in the assignment. (TSM06)

If an assignment is written and completed in the last few hours nearing the due date, some participants claimed that there could be a possibility that a student may copy another student's work:

...might end up cheating by copying somebody else's work in order to hand it in to gain a mark. If the lecturer catches you, you would be given a zero mark which we do not want. (TSF09)

Managing these demands is about "streamlining" a piece of work (Smith, 2003, p. 17), and allowing time for the editing stage and proofreading. However in desperation to submit work on time the copying of another student's work in the last hour is practiced in the Solomon Islands, as the data showed. Copying is part of what is referred to as "academic dishonesty" (Jones, 2011). A student in this situation then becomes guilty of plagiarism (Jones, 2011; Richman, 2007).

Suggestions to deal with last hour assignment completion

A few suggestions that could help to deal with the practice of last hour assignment completion based on the findings and discussions are listed and briefly discussed in this section of the paper.

- (a) *Paying attention.* To overcome the issue of lack of concentration, it is necessary for students to focus on one thing at a time. If a student focuses on a variety of things at the same time, the student's attention may be divided. This should be avoided. Changing the work or study environment may also help a student to concentrate. For example, moving to the library which is a bit quieter than an empty classroom to do studies or write an assignment may help.
- (b) *Procrastination.* Staff of a school should encourage students not to delay writing an assignment. As soon as the assignments are given, the students should start making plans of what information would be required and where to get it. If the students see that an assignment seems large, they should break it up into smaller manageable pieces and do one piece at a time (Pitts & Bennett, 2011; Zarick & Stonebraker, 2009). Better still, a student may make a schedule to do the chunks.
- (c) *Learning resources.* School authorities should take the responsibility of making available adequate learning resources such as computers, internet access, desks, tables, chairs and better library support services at SOEH or in any schools. These are important to support the students' learning, performance and achievement when it comes to writing and completing assignments.
- (d) *Time allocation.* Although a time of four weeks is given to students to write and complete assignments, some students cannot cope with the time allocation. Institutions might look into lengthening assignment lead up times to allow extra time for students to complete assignments thoroughly.
- (e) *Time management.* Students are very busy people in terms of writing and completing assignments while going to classes five days a week. As part of managing their time, students should be assisted to set their priorities and look at their tasks in terms of their importance and urgency.
- (f) *Load reduction.* There are times when more than one assignment is due on the same date. As this is one of the main causes of completing assignments in the last hour, lecturers at

the SOEH should liaise with one another so that assignments would be due on alternative dates. Apart from that, the amount of readings given to students should be reasonable and must not be too long and so many that students become overly preoccupied with readings and unable to spend time writing and completing assignments well before the due date.

Conclusion

Assignments are important in students' learning, performance and achievement. Therefore, they should be properly written, edited, and proofread before being submitted on or before the due date. This case study has brought to surface reasons why teacher trainees at the SOEH, SINU, in the Solomon Islands complete assignments in the last hour. The reasons range from personal commitments, such as putting family matters first, lack of concentration and procrastination, to academic related reasons such as reading loads, learning resources (such as computers) that are not adequately provided, and several assignments needing to be completed on the same date. The practice has some impacts on the students' learning, performance, and achievement. For example, last minute work may give students the courage and motivation to concentrate more on the assignments, but may also make the students commit plagiarism.

The reasons for, and the especially the negative impacts of, assignment completion in the last hour should send a message to both students in the Solomon Islands and the Pacific, and to their institutions of learning.

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Vaka Pasifiki

Keep Doing...

Stream 2

Continuing Professional Development in the Nauru Teacher Education Project

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Abstract

The Nauru Teacher Education Project (NTEP) is a Pacific focused two-phase teacher education partnership between the Nauru Department of Education and the University of New England, Australia. Its first phase began in early 2014 as a mixed-mode delivery offering online teaching materials with continuous, full-time, and on-island support to enable the students to remain in their community environment. This first cohort is now in the project's second phase as beginning and returning teachers to the Nauruan teaching profession. Sustainability of the NTEP is being evidenced as the majority of the first cohort adapts their learning and teaching knowledge and wisdom in their classrooms, while they articulate from a full-time Associate Degree in Teaching (Pacific Focus) to a part-time Bachelor of Education (Pacific Focus). Also noted, is a Nauruan professional community of practice emerging among the project's beginning and returning teachers, a second cohort of pre-service and in-service teachers who commenced the Associate Degree mid-2015, the Nauru Department of Education, and the NTEP support lecturers. This community of practice is helping to establish a shared continuing professional teacher development using pedagogical strategies relevant to the local Nauruan context. Strategies being used include: educative mentoring, school and year-level teacher workshops, one-to-one modelling of effective approaches to teaching, context specific learning, and reflective classroom management practices. The strategies are personal, collegial and professional, and acknowledge the aspirations of Nauruan educators and families, the NTEP co-governors, and support lecturers. The co-governors and Nauru Department of Education continuously monitor the NTEP in order to facilitate its beginning and returning teachers and its second cohort of pre-service and in-service teachers. Findings and recommendations are relevant and of interest to Pacific teacher education in general, and especially to the initial and continuing development of teachers in Nauru.

Keywords: Nauru, initial and continuing teacher development, communities of practice, Pacific education

Introduction

A major challenge in keeping abreast of relevant and effective curricula is the many years it takes to develop and implement. In that time, rapid advancements are usually made in research and conceptual understanding of pedagogies and content, which often make curricula outdated before they are fully implemented. In order for teachers to adapt their curricula with context-appropriate pedagogies and content, they need to first broaden and deepen their teaching and learning understanding by studying and using a range of curricula frameworks that reflect current local and global theories. When teachers engage with other curricula, they gain a firm understanding from

which to make informed decisions about their own curriculum in their own classrooms. Only in comparing aspects of various curricula and critically reflecting on them in terms of their local contexts, do educators gain insight into possibilities for rethinking aspects of their own curriculum, and for leading change in classroom and systemic practices.

In the Republic of Nauru, an educational change agent project is being implemented whereby the Department of Education has partnered with the University of New England to develop a two-phase teacher education programme with a Pacific focus. The first phase began in early 2014 as a mixed-mode delivery, offering online teaching material with continuous, full-time, and on-island support to enable the students to remain in the context of their community for their studies. The students had a choice of studying Early Childhood Education, Primary Education, or Secondary Education. The Nauru Teacher Education Project (NTEP) set out to develop its pre-service and in-service teachers with educational change agent capabilities. Consequently, the second phase has a sustainable change component. This second phase of transforming the classrooms and schools began in early 2016. It included the NTEP beginning and returning teachers entering their classrooms after graduating from a full-time Associate Degree in Teaching (Pacific Focus), while articulating to a part-time Bachelor of Education (Pacific Focus). It includes in-school orientation and induction as well as continuing professional development mentoring within a professional community of practice. It also has the long-term aims to sustain school improvement and to build a local team of teacher-educators with the capacity to provide the all-encompassing island academic support to help later cohorts complete this Pacific-focused international teaching qualification. The project design has an associated research and programme evaluation component, of which this report is a part. This report includes interview responses from the first cohort of NTEP participants who have graduated from the first phase, and have become beginning and returning teachers with the Nauru Department of Education.

The beginning and returning teachers are achieving the goals of this NTEP workplace phase by interweaving their indigenous Nauruan custom of teaching and learning with global pedagogies and resources. This is to create a sustainable, ongoing teacher development and coherent standards-based profile for Nauruan teachers. In effect, they have become significant change agents of the Nauru Department of Education, and their continuing teacher development has become crucial to creating sustainable, quality Nauruan education.

Now that these beginning and returning teachers have a working level of professional autonomy in their own classrooms, they are ideally placed to form a professional community authenticating teaching and learning. They will synthesize the best practices from indigenous Nauruan teaching and learning as well as global teaching and learning. This will be done by way of selecting and adapting teaching and learning resources to achieve what constitutes as quality Nauruan teaching and learning in their classrooms. It is essential that the beginning and returning teachers develop the skills required to mentor each other in such a way that the mentor and mentee adapt to each other's personal and professional needs of orientation, induction, and continuing professional development.

Significance of the First Five Years of Teaching

Commenting on recent Canadian research into beginning teacher experiences (Alberta teachers Association (ATA), 2013; Clandinin, Schaefer, Long, Steeves, McKenzie, Pinnegar, Wnuk & Downey, 2013; Hargreaves & Fullan, 2012) Couture (2015) emphasises the far-reaching influence of systemic school and community dynamics, and the importance of optimal community of practice conditions for sustaining continuing professional development of beginning and returning teachers. More specifically, educational authorities need to ensure a comprehensive approach to effective orientation, induction, and continuing professional support throughout the first five years of teaching. The research highlights the importance of creating spaces and opportunities for beginning and returning teachers to compose their teacher identities. Teachers need to understand their work as a craft and themselves as artists; expressing their personal practical knowledge through the medium of their professional workplace community. Educative mentoring and dialogue creates this required environment for teacher identities to merge with educational contexts, thus enabling teachers to form strong sustaining ties to the profession.

Hochberg, Desimone, Porter, Polikoff, Schwartz and Johnson (2015) found that, although formal mentoring was the key strategy in most teacher induction programmes, informal community of practice mentoring was often more effective in sustaining continuing professional support during the first five years. Their research demonstrates that beginning and returning teachers maximise their development when they inter-personally and inter-professionally interact with friend/colleagues. They suggest that authorities need to actively coordinate a hybrid mentoring approach through establishing formal support strategies in addition to encouraging a supportive school culture that nurtures informal communities of practice. Similar hybrid professional support strategies were documented amongst New Zealand teachers in all levels of schooling. This included indigenous Maori medium settings with beginning and returning teachers. The most effective were those associated with community of practice dynamics (Piggot-Irvine, Aitken, Ritchie, Bruce Ferguson, & McGrath, 2009).

Puamau (2007) points out that there are few formal comprehensive, continuing professional support programmes for beginning and returning teachers in countries across the South Pacific. Pacific Island teachers are required to attend professional development only when the authorities need to communicate curricula changes affecting classroom teaching. However, the communal culture of the Pacific facilitates informal in-house professional development, involving small communities of practice. These professional environments could do well to focus on synthesising the best of local or indigenous pedagogies with the best of contemporary global practices.

Koya Vaka'uta's (2012) review of Pacific education emphasises the recurring themes of achieving a distinct Pacific educational authenticity and sustainability through collegial communities of practice. Dorovolomo (2014) envisions a linking of these communities of practice across initial and continuing teacher preparation to produce a continuous flow of professional development from initial teacher preparation through to beginning and returning teacher orientation, induction, and eventually career-long teacher development. He points out that this process needs to be formal and informal,

involving mentoring that is flexible enough to adapt to the growing and changing personal and professional needs and varied institutional contexts. Dorovolomo (2014) prefers the use of learning organisational structures and processes to establish and sustain his vision of cross-organisational and internal communities of practice that sustain such a range of teacher development. Teacher educators, principals, beginning and returning teachers, and experienced teachers need to formally and informally support each other. Their strategies would include: educative mentoring, school and year-level teacher workshops, one-to-one modelling of culturally appropriate methods of teaching, context specific learning, and reflective classroom management practices. Such induction and continuing professional development dynamics must take place in nurturing personal, communal, and professional contexts that acknowledge the hopes and aspirations of the local communities.

Research Purpose

Through supportive educative mentoring of the beginning and returning teachers as they taught in their classrooms, and the use of open-ended questions to stimulate discussions about their orientation and induction into the Nauru education system, the researchers were able to not only gain data for this report on the beginning and returning teachers' transitions into the profession, but also to facilitate and sustain a fledgling community of practice.

Research Questions

Two research questions guided this research:

1. What challenges did the beginning and returning teachers face and how did they overcome them?
2. What support groups are available to ease the transition into the profession and how could this support be sustained?

Method

The interview group was comprised of 14 beginning and returning teachers. Of the five beginning teachers, two were in early childhood and three were in primary. Of the nine returning teachers, four were in early childhood and five were in primary. Interviewees were invited to participate obligation free, and given informed, written, and signed consent. The University Ethics Committee granted ethical approval under NTEP Approval Number: HE14-030.

Interviews were conducted while the group was in the early stages of transitioning to teaching. In one-to-one interviews, the beginning and returning teachers were asked five open-ended questions. Responses were digitally recorded and transcribed. The opening beginning and returning teacher interview questions were:

1. How is everything going with your teaching at present?
2. What have you been able to use from your UNE studies so far?
3. What do you want to do in your classroom?
4. How do you intend to evaluate and sustain new teaching ideas in your classroom and school?

5. What types of support do you think would help you to use your UNE studies in the classroom?

Early Experiences of the Beginning and Returning Teachers

The beginning teachers, in particular, found the initial aligning of theory with practice very challenging because of their new teaching and learning contexts. Although they understood and practiced their professional learning in familiar educational environments during their teacher preparation course, they now had to perform autonomously in situations of overcrowded classrooms with very few teaching and learning resources. This meant that their classroom management and preferred teaching strategies were to be tested to their limits. It was in this environment that the beginning and returning teachers needed to adapt current global educational theory and practice to become applicable and effective in their Nauruan context.

Most outstanding during this initial period of induction and orientation was the beginning and returning teachers' sense of professional optimism, perseverance, and commitment, with one saying:

“Very, very challenging since I don't have something that I need. I don't have the resources. If a classroom is well organised, the students will behave ... I feel tired – it is so challenging.”

The task of adapting pedagogies and curricula studied and practiced during the course was clearly contextualised by another beginning early childhood educator. Her task was to find an effective and acceptable balance between applying interest-based pedagogies in a more prescriptive topic-based context. As well as this practical task, she had to design her planning in such a way as to have it accepted by her principal and colleagues:

“I have been struggling a bit ... There is this planning that we are required to do ... What we have studied is that we have to work towards children's interest and we then can develop from there. In the school, it is different as there are things we are required to do. (She continues to give an example about dinosaurs). I try to put my study and what we do in class together but I can't choose and the children cannot choose the topic.”

As a professional response to similar issues faced by the majority of beginning and returning teachers, a Nauruan professional community of practice is emerging among the project's beginning and returning teachers, a second cohort of pre-service and in-service teachers who commenced the Associate Degree mid-2015, the Nauru Department of Education, and the NTEP support lecturers. Their community of practice sharing is helping to establish continuing professional teacher development using pedagogical strategies relevant to the local Nauruan context:

“We never have the time to meet up and talk but I really want to share things with them [other staff].”

And:

“I invited parents in last Friday because we don’t have anything, no colours, no pens, [and] no markers. It’s a pretty boring room ... I sent out notes to all my parents for what I need them to bring for each student.”

Beginning and Returning Teachers’ Professional Vision, Goals, and Plans

As a professional group, the beginning and returning teachers are an emerging professional force for change across the Nauruan educational system. Their aspirations draw out their potential for change. A beginning early childhood educator expressed, *“I’d like to share my ideas with others and work more together”*.

And another returning early childhood educator mentioned, *“I asked the Principal if the school can [would] provide more nutritious food in the school. Maybe inviting parents to come in the school and talk about it.”*

A beginning primary teacher expressed a strong desire, “I want to implement peer assessment”, while a returning primary teacher pointed out, “[I want] parental involvement e.g.: fundraising with parents for materials and getting new story sacks made”.

And lastly, from a returning early childhood educator, demonstrating the breadth and depth of these beginning and returning teachers’ sense of responsibility of what it means to be a classroom teacher and their vision for their classroom, school and system, “Another major aim for Term 2 ... is fixing backyard play area”.

NTEP Delivery of Continuing Professional Support

In response to these aspirations, educative mentoring and continuing professional development take place in nurturing personal, collegial, and professional contexts that acknowledge these aspirations of Nauruan educators and families as well as the NTEP co-governors and support lecturers. Without fully knowing what challenges are yet to emerge, the co-governors and the Nauru Department of Education continuously monitor the NTEP in order to facilitate its beginning and returning teachers and its second cohort of pre-service and in-service teachers. Strategies being used include: induction and educative mentoring, school and year-level teacher workshops, one-to-one modelling of effective approaches to teaching, context specific learning, and reflective classroom management practices.

When asked how could the NTEP join their professional community of practice in order to provide the much-needed continuing professional support, a beginning primary teacher requested, “Help me with hands-on resources”.

The lack of commercial teaching and learning resources was considered to be a major obstacle for the beginning and returning teachers to implement their preferred pedagogies. During a mentoring session with a NTEP support lecturer to consider alternative solutions, one beginning primary teacher explained, “I want to collect shells for use as counters, start improvising to make resources”.

Such mentoring sessions were productive and educative for the NTEP mentor and the mentees. Each session developed the beginning and returning teachers’ sense of

confidence and made them more independent and proactive. Often the mentees wanted these educative mentoring sessions, “Just to see if I am doing the right thing”, or for benefits such as, “Having someone to back me up when I am trying to justify my methods”.

Conclusions about the Continuing Professional Development

The most striking observation of the beginning and returning teachers was their sense of professional optimism, their perseverance, and their commitment to educating the next generation of Nauruans. Despite a scarcity of resources and difficulties aligning theory to practice, every beginning and returning teacher expressed a deep desire to not only succeed in their own classroom, but to share their professional knowledge with colleagues and become significant change agents across their schools and system.

Following on from a large body of initial teacher preparation and continuing professional development, especially during the significant first five years, the NTEP has established and maintained formal and informal educative mentoring structures and processes that are nurturing fledging professional communities of practice. The NTEP and the Nauru Department of Education vision and goals are to establish educative mentoring by which all stakeholders may learn from each other. Such a structure and process is envisaged to support the initial enculturation of the beginning and returning teachers and to propagate school and systemic improvement. The NTEP is encouraging the sense of professionalism and ownership of the beginning and returning teachers until they can form independent communities of practice that have the strength of ownership to sustain themselves after the NTEP funding ceases.

Recommended Strategies for Continuing Professional Support

Following the New Zealand conclusions of Hochberg, Desimone, Porter, Polikoff, Schwartz, and Johnson (2015), who reiterate the significance of the first five years of the professional career life of teachers, it is essential that sustainable continuing professional development be prioritised by the Nauru Department of Education and the NTEP. The premise is that the first five years are considered critical for establishing and sustaining professional enculturation into the profession, as well as for aligning new pedagogies with existing school professional and communal cultures. In addition, the formal induction, orientation, and mentoring structure are essential to nurturing the development of an informal communal process initiated, maintained, and most importantly, owned by the beginning and returning teachers through the support of the Nauru Department of Education and the NTEP.

This hybrid approach involves developing formal and informal, self, and other supported and nurtured communities of practice in each school community. A further phase would be to encourage a network across the Nauru system, which consists of only a handful of schools. This approach appears to hold the most relevance to many small Pacific education systems and especially to the initial and continuing development of teachers in Nauru.

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South-South Development Cooperation: Cuba's Yes, I Can! Adult Literacy Model in Timor-Leste and Aboriginal Australia

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Abstract

Low levels of adult literacy in a nation's official language(s) have long been recognised as a major barrier to the achievement of local and national development goals, and mass adult literacy campaigns have proven an effective way to overcome this problem. Following their own successful mass campaign in 1961, Cuba began helping many other countries run similar campaigns. Over time, Cuban adult educators developed an innovative campaign model which could be adapted to specific country contexts, and has now been deployed in 30 countries around the world reaching over 9 million people. In the last decade, the Cuban model, now called "Yes, I Can!" ("Yo, Si Puedo" in Spanish) has been used successfully in Timor-Leste with over 20,000 participating adults. It is now running in five remote Aboriginal communities in Australia. The authors of this paper worked on the Timor-Leste campaign with a team of Cuban advisers and Timorese nationals from 2006 to 2012, and began using the model in Australia in 2012. In this paper, we describe the model and how it has worked in these two different contexts, presenting evidence of the campaign's impact on the people and communities who have participated. Cuba's unique model of south-south education cooperation will be of interest to Pacific Islands educators and policy makers, who may also be struggling with the challenges of low levels of literacy among some sectors of their adult populations.

Keywords: adult literacy, south-south cooperation, Timor-Leste, Aboriginal Australia, Cuba.

Introduction

In 2005, the Cuban government sent a team of literacy educators to Timor-Leste to help the FRETILIN government implement a national adult literacy campaign. This followed the deployment of a team of Cuban doctors, who had arrived already to help the newly-independent island state to develop a primary health care system. Both missions, the medical mission and the adult literacy mission, were examples of "south-south" cooperation, whereby countries of the Global South assist each other to achieve their development goals.

In 2012, Cuba also began a cooperation programme with Aboriginal communities in Australia, with the aim of developing a national adult literacy campaign and utilising the same model as had been used in Timor-Leste. After a successful two-stage pilot in three communities, the campaign has begun to upscale under the leadership of a national Aboriginal-controlled organisation called The Literacy for Life Foundation. While so far the campaign has reached only five remote communities in the far

western region of the state of New South Wales, many other Aboriginal communities from all over Australia are now asking to join.

In this paper, we begin by identifying the extent of illiteracy in the Global South and, in particular, in the Pacific. We then provide some background on mass adult literacy campaigns internationally before moving on to describe how Cuba developed the “Yes, I Can!” (“Yo, Si Puedo!”) model, which has now been used in 30 countries mainly in the Global South (Boughton & Durnan 2014a; Valdés Abreu 2016). We then describe in more detail how the model has worked in Timor-Leste and in Aboriginal communities in Australia, based on our direct experience working with these campaigns. The paper concludes with a discussion of the role of international solidarity in Cuba’s model of south-south cooperation.

The challenge of adult illiteracy

High rates of illiteracy are recognised as one of the most significant challenges in the field of international aid and development, and their reduction is a major policy goal of the international community. At the beginning of this century, 164 governments agreed to the United Nations Declaration on Education for All (EFA), calling for a 50% reduction in adult illiteracy by 2015 (UNESCO, 2005). Underlying this policy was a view about the beneficial effects of literacy on a range of other indicators of development. For example, according to a statement issued at the launch of the United Nations Literacy Decade:

creating literate environments and societies is essential for achieving the goals of eradicating poverty, reducing child mortality, curbing population growth, achieving gender equality and ensuring sustainable development, peace and democracy. (UNESCO, 2005, p. 31)

Similar statements can be found in the publications of most international development agencies. However, by the end of 2015, only 23% of the 73 countries for which data was available had achieved the goal, and over 780 million people, of whom 64% are women, still lack basic literacy. This is almost entirely a problem of the Global South, with 98.8% of global illiteracy occurring in developing countries (UNESCO, 2015).

UNESCO estimates the number of adults who are illiterate in the Oceania Region at around 1.9 million. While not all countries’ illiteracy rates are available, it appears that low levels of adult literacy are a significant issue in several Pacific countries. For example, UNESCO currently estimates that in Papua New Guinea, over one third of the population lacks basic literacy, while in Vanuatu the figure is 15% (UNESCO Institute of Statistics, accessed May 2016). The Solomon Islands was singled out in the 1990s as having a very low adult literacy rate (around 30%), and a small local survey in 2006 by the Asia South Pacific Bureau of Adult Education (ASPBAE) in 2006 found an even worse situation (Prasad & Kasumae 2012, p. 22). In any case, these figures are almost always only estimates, and more research would be needed in each country to establish firmer figures. However, the point remains, that the absence of a strategy to improve adult literacy rates will mean that barriers to peoples’ development objectives will be hard to overcome.

Mass Adult Literacy Campaigns

The mass campaign model for building adult literacy has been a feature of development efforts in many countries over several hundred years, and most recently in countries of the Global South (Arnové & Graff, 2008). As two international experts describe it:

The mass campaign approach... seeks to involve all segments of society in order to make all adult men and women in a nation (*or region*) literate within a particular time-span. Literacy is seen as a means to a comprehensive set of ends – economic, social, structural, cultural and political. (Lind & Johnston, 1990, p. 85)

In the second half of the twentieth century, many newly independent countries of the Global South undertook mass adult literacy campaigns. In some cases, these campaigns had already begun before independence, led by national liberation movements fighting to remove the colonial powers which were ruling them at the time. In other countries, Brazil for example, the campaigns were initiated by radical governments who came to power on a programme of becoming more independent of the dominant world powers of Europe, Japan, and the United States. These campaigns had significant success, but the radical political and economic agendas with which they were associated created a counter-force, and eventually the dominant powers, acting through the World Bank and the international aid and development industry, succeeded in pushing them off the international agenda (Boughton, 2016). In place of national literacy campaigns, donors encouraged small scale adult literacy programmes run largely by NGOs. While these had some success, they had little impact on the overall rates of literacy in the countries in which they operated, and the problem of mass illiteracy continued to grow.

In keeping with their scale, mass literacy campaigns measure their initial success using simple population-level definitions of the literacy rate; that is, the number of people able to read and write a simple sentence or paragraph about one's life in one of the official languages of the country concerned. Unlike small-scale literacy courses and programmes, mass campaigns set out to achieve population-level change. They generally form the first stage of a much longer process, in which previously "illiterate" adults are encouraged to participate in a staged process of non-formal mass adult education, designed to build literacy, numeracy, and general knowledge in the population as a whole, up to at least the level achieved through basic (i.e. primary) school education (Bhola, 1984).

The Yo! Si Puedo (Yes! I Can) Model

Cuba's own national literacy campaign occurred 55 years ago in 1961, following the victory in 1959 of Fidel Castro's political and military campaign to overthrow the US-backed Batista regime (Abendroth, 2009). Cuba then began providing support to other countries of the Global South to undertake their own campaigns. Over the last five decades, Cuban literacy educators have accumulated significant experience and expertise. In 2000 they began experimenting with a new model for undertaking this work, using audiovisual resources which could be utilised by less qualified teachers to reach many more people than had been possible by other methods.

However, the model is not simply a method of teaching. Rather, it follows a three-phase design which has also been used in many other campaigns around the world, ones which used other teaching methods and resources. Following a period of preparation in which the national structure and resourcing is laid down, the campaign rolls out at a community level in three phases, each of which supports the other two. Phase One, called Socialisation and Mobilisation, seeks to engage the whole community in addressing the problem with extensive community education, including training local leaders and staff in the model; visits to every household by local staff to discuss the issue of literacy and gauge the level of interest; promotion and publicity; the signing up of local organisations and agencies as campaign partners and sponsors; a public campaign launch. Phase Two comprises a set of 64 basic literacy lessons, taught to groups of 15-20 adults per class by specially-trained local facilitators using the “Yes, I Can!” audio-visual resources. Phase Three, called Post Literacy, engages the partner organisations working with the campaign team to provide opportunities for the new graduates to consolidate their literacy in structured activities and work experience, with the aim of building pathways into further education, employment, and socially-useful community work. The first phase continues while the second and third phases take place so that the campaign gains and maintains momentum; and a new group is recruited to undertake the lessons (Phase Two) as the first group finishes Phase Three. The campaign continues until everyone who has been identified as having literacy issues has had the chance to participate, or until the organisation leading the campaign has achieved the target reduction in “illiteracy”.

The Lessons

The Cuban-made DVD lessons are a defining feature of the “Yes, I Can!” model. When participants arrive for class, they sit in chairs and behind desks with a large TV screen at the front of the room. The facilitator introduces the lesson briefly, and then the students watch a 30-minute DVD on a TV screen. On the DVD, they see a class of five “actor-students” learning how to read and write from an “actor-teacher” and an “actor-assistant teacher”. From time to time, topics being talked about in the class will be illustrated with footage of scenes from the region of the actor-students. During the lesson, the facilitator stops the DVD, so the actual students can discuss a topic, or complete in their workbooks an activity which they have just seen completed by the actor-students. Following the DVD lesson, participants spend another 30 minutes doing practice activities. Watching the DVD lesson and completing the practice activities takes a maximum of one hour.

The teacher on the DVD uses a “traditional” phonics instruction method in the following sequence: first with building letter and sound awareness; followed by the technique of writing, then the ability to hear, read and write letters, moving on to words and phrases, and progressing by the final lessons to sentences and paragraphs. Each letter is learned in the initial 42 lessons through association with a specific number, using a Guide Table – for example, 1 – a, 2 – e, 3 – i, 4 – o, all the way to 26, in the case of the English version. The Cubans call this method “alphanumeric”, and it was adopted because of the belief that, even in communities with very little literacy, there is some familiarity with numbers because of money and markets. The numbers correspond to the importance of the letter in constructing words – for example, in the

English version, vowels are 1–5 – and the subsequent numbering follows as closely as possible to the frequency of each consonant’s use in the language of instruction.

The lessons are divided into three stages. There are 7 basic introductory lessons, 45 reading, writing and revision lessons, and 12 consolidation and extension lessons with assessment activities. Lesson 1 introduces the model, and Lesson 64 is an evaluation activity for the facilitators. Lessons 2–6 are designed for people with no prior experience of reading and writing, and include exercises to practise holding a pen and forming simple shapes. Because almost all the participants in Australia have had some basic instruction in the past, we have been able to skip over these lessons and go straight from Lesson 2 to Lesson 7.

Each lesson follows a predictable structured sequence, which the Cubans call an “algorithm” and which the students and facilitators quickly learn. As further discussed below, the lesson begins with a discussion topic, which introduces a key letter or word. Easily recognisable icons in each lesson cue the students to observe, listen, speak, and write, following the example of the students on screen. Each class ends with another period of practice of the letters and words learned during that session. As suits people with minimal or no prior literacy and minimal confidence as learners, the initial steps are very small; beginning with motor skills, then vowels and consonants, then diphthongs, reading, generating, and writing words using these graphemes. Progress remains slow until Lesson 46, at which point participants begin to write sentences and then learn “connector words” to form paragraphs. Along the way, very basic punctuation is also taught. From Lesson 50 onward, comprehension of more complex blocks of text is regularly checked, and students learn to fill out forms with basic personal data. In the last eight lessons, students complete exercises which form the basis of the assessment of their competence at the exit point, in that they learn to produce in their workbooks a simple letter to a friend including description and opinion. From our direct classroom observations, an outstanding feature of this structured pedagogy is that local facilitators quickly learn how to teach the lessons through following the example of the actor-teacher. At the same time, students are learning to become literacy learners by the same process, watching and copying the learner behaviour of the actor-students. A “community of practice” is quickly established, and is one of the aspects of the model which students and staff most value.

There is no formal assessment in the sense of a test. Instead, the local staff and the advisers review student progress by observing the class and the student work that is completed in the pre-printed workbooks and locally-generated worksheets. This is, in effect, a continuous assessment process. Detailed weekly records are maintained showing who is “advancing” and who is not, and those who are falling behind or struggling receive additional support.

Positive messages

This is a critical element in the “Yes, I Can!” model. At the beginning of each lesson, the actor-teacher introduces a simple sentence which includes the letter to be learned in that lesson, but which also contains a particular message in relation to attitudes and values, comparable in some respects to the “generative themes” of Paulo Freire’s

culture circles. The sentences on the Grenadian DVD lessons (being used in Australia) include:

1. Open the gate
2. Let kids be kids
3. People love peace
4. My thoughts are with you
5. Take care of the sea (from over fishing, pollution etc.)
6. Our future is secure
7. Love your family
8. Put the rubbish away (recycling and disease)
9. Look after the woods/forest (we say “scrub”, or bush)
10. Give me a hand (solidarity)
11. Music is part of our culture
12. I am a friend
13. Elderly are important. They need our love and respect
14. Mind the time
15. Help your family

After watching the actor-student class discuss this topic on the DVD, the local facilitator leads a discussion in the actual class. Students are asked: “What do you think about this message?” or “Is this important here for us?” The aim is to stimulate reflection about the social conditions in which the students live. This also helps to contextualise the lesson to the local circumstances of the students, and it generates new local words, using the letter for that day’s lesson.

Timor-Leste

The first adult literacy classes of the Timor-Leste National Literacy Campaign opened in June 2007, in the country’s capital, Dili. Over the following twelve months, the government opened four hundred more classes, reaching almost every village across the nation. There were eleven Cuban educators in the initial adviser mission, and this was expanded to thirty-five as the campaign rolled out. Each adviser lived in the rural areas, apart from two who managed operations from the capital, Dili. The role of the advisers was to train and support the local tutors, called monitors in Timor-Leste, regularly visiting the classes in each village in their sub-districts with their Timorese counterparts, called sub-district and district coordinators, to monitor progress. The FRETILIN government, which launched the campaign, appointed a National Literacy Campaign Commission, representing several government departments as well as the Churches and NGOs, to oversight the campaign, and there were also commissions established in each district and sub-district. However, this structure was dismantled when FRETILIN lost the 2007 elections, and management of the campaign was taken over by the Ministry of Education, which reduced the commitment of other agencies to the campaign. Nevertheless, by the time the campaign ended, over 200,000 people had joined the classes, and every one of the thirteen districts in the country had been declared “free of illiteracy” (Boughton, 2010; Boughton & Durnan, 2014b).

We (the authors) were commissioned in 2006 by the FRETILIN Minister of Education to undertake a participatory action research evaluation of the Timor-Leste national literacy campaign as it rolled out, and our study was supported with a grant

from the Australian Research Council from 2007-2009. When the study ended, we continued to make field trips to Timor-Leste to monitor progress until the campaign officially concluded in 2012. The findings from our research have appeared in a number of publications, listed at the end of this paper. As we concluded in one of those publications:

With the Timor-Leste national literacy campaign, Cuba has succeeded in facilitating the first national adult literacy campaign to be undertaken in the Pacific region. Moreover, it has done this largely outside the normal international aid and development structures, as an expression of south-south cooperation and solidarity. This experiment is destined to provide a new benchmark against which the aid efforts of other countries in the region will be assessed by recipient countries. The campaign is also providing a test of the value of the innovative adult literacy method invented by Cuba, known as “Yo Si Puedo”, against a background of extreme poverty and devastation, and the effects of three decades of war and violence. It also, therefore, provides the international community with an object lesson in the contribution of literacy to post conflict reconstruction and peacebuilding. If it succeeds, and the problem of illiteracy in Timor-Leste is overcome, the Cuban mission will have provided an essential foundation for the development in the longer term of a sustainable national system of adult education to support the country’s national development goals (Boughton, 2012).

Aboriginal Australia

The success of the campaign in Timor-Leste was already evident by 2009, when the authors of this paper gained the support of the Lowitja Institute, a national Aboriginal-controlled health research body, to present the findings of our study of the Timor campaign to a workshop of Aboriginal health and education leaders. From this workshop, a national committee was set up to seek funding from the Australian government to pilot the Cuban model in Aboriginal communities in Australia. After negotiations with the Cuban government, an adviser was sent to Australia, and the pilot began in 2012 in the remote town of Wilcannia in western NSW. It was extended in 2013-2014 to two more towns in the same region, Bourke and Enngonia. The pilot achieved significant success, although on a much smaller scale than in Timor-Leste, and a new national Aboriginal-controlled organisation, the Literacy for Life Foundation, has now been established with the aim of mounting a national campaign. The campaign has now run in four communities, and is currently being extended to two more. The resources being used for the Australian campaign were originally developed for the national literacy campaign in Grenada, an English-speaking island in the Caribbean (Boughton et al., 2013; Boughton & Durnan, 2014a).

To date, over 100 Aboriginal adults have graduated from the campaign, with a completion rate five times that of conventional literacy programmes run through the national vocational education and training system (Guenther et al., 2016). As with the Timor-Leste campaign, the work in Australia has been evaluated using a participatory action research methodology, and the results published in articles and papers listed at the end of this paper.

Conclusion: Cuba's Contribution to South-South Development Cooperation

Although it has gained more currency in recent years, the concept of south-south cooperation is not new, but has been central to the practice of independent post-colonial states and national liberation movements at least since the emergence of the Non-Aligned Movement in the 1950s. Following its own revolution in 1959, Cuba was at the forefront of this practice, providing aid in the form of military, health, and educational assistance to countries and social movements in Latin America, the Caribbean, and Southern Africa. However, unlike the model of south-south cooperation now promoted by international donors and the World Bank as “best-practice transfer”, Cuba’s aid is based on the socialist ethic of human solidarity, the idea expressed by Cuba’s national hero, Jose Marti, that “Our homeland is humanity” (Gonzales et al., 2012; Muhr, 2013; 2015). We have seen the enormous benefits of this approach directly for ourselves, with both the medical mission and the literacy campaign in Timor-Leste, and now with the Aboriginal adult literacy campaign in Australia. We therefore present this paper in the hope that it will generate interest and support within other countries and movements in the Pacific, not just in the mechanisms of these operations, but in furthering the ethic of international solidarity which they express.

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Rethinking Pacific Education Initiative/Vaka Pasifiki-Generated Literature: a Critical Review

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Abstract

This paper constitutes a critical review of the literature emerging over the past twelve years from activity of the Rethinking Pacific Education Initiative by and for Pacific Peoples (RPEIPP) and Vaka Pasifiki (VP) series of conferences. This literature has largely, but not exclusively, been generated by Pacific scholars for and about Pacific contexts, thus providing a variety of “insider perspectives” over a wide geographical area and a range of themes and topics. The literature is reviewed in order to explore the three themes of the conference; that is, for what it indicates Pacific scholars, researchers, and educators might stop doing, keep doing, and start doing.

Based on both a descriptive analysis of blurb material, introductory and concluding chapters, and a quantitative analysis of index entries, the paper highlights the range of themes and topics covered by this new body of literature. The paper claims that, based on the empirical evidence, the RPEIPP/VP-generated literature is timely in that it addresses the often-cited lack of relevant, contextual literature. Added to this, the processes employed to generate the literature are inclusive, unique, and innovative. Thus, it is argued that this growing body of work may be considered individually and collectively as a tangible representation of epistemic decolonisation. It concludes that in terms of both content and processes employed, the literature is a valuable resource and is able to inform on many levels and topics and to provide direction for both Pacific scholars and others engaged in Pacific education.

Keywords: Rethinking Pacific Education Initiative, Vaka Pasifiki, Pacific education, Pacific research, Pacific academic literature.

Introduction

This paper constitutes a critical review of the literature emerging over the past twelve years from activities of the Rethinking Pacific Education Initiative by and for Pacific Peoples (RPEIPP), more latterly renamed Vaka Pasifiki (VP) (see ‘Otunuku, Nabobo-Baba, & Johansson Fua, 2014; Sanga, 2012; van Peer & Abella, 2014). The literature has largely, but not exclusively, been generated by Pacific scholars for Pacific peoples and about Pacific contexts, thus providing a variety of “insider perspectives” over a wide geographical area and range of topics. The literature was reviewed in order to explore the three themes of the 2016 Vaka Pasifiki Education Conference; that is, for what it indicates Pacific scholars, researchers, and educators might most effectively stop doing, keep doing, and start doing.

The review comprised 11 texts published from 2001-2014 – presented below in chronological order. Those marked with * have no index. The most recent addition to the RPEIPP/VP library – Toumu‘a, Sanga, and Johansson-Fua (2016) – was not available for inclusion at the time the review was conducted.

1. Pene, F., Taufe'ulungaki, 'A., & Benson, C. (2002). *Tree of Opportunity: Rethinking Pacific Education*. Suva: Institute of Education, USP.*
2. Sanga, K., Niroa, J., & Crowl, L. (2004). *Rethinking Vanuatu Education Together*. Suva: USP Institute of Pacific Studies.
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11. 'Otunuku, M., Nabobo-Baba, U., & Johansson Fua, S. (2014). *Of Waves, Winds and Wonderful Things: a decade of rethinking Pacific education*. Suva: USP Press.*

The paper presents an explanation of how the review was conducted and a discussion of the findings.

The review

For the review, we were interested in both the content of the books and the processes used to generate them.

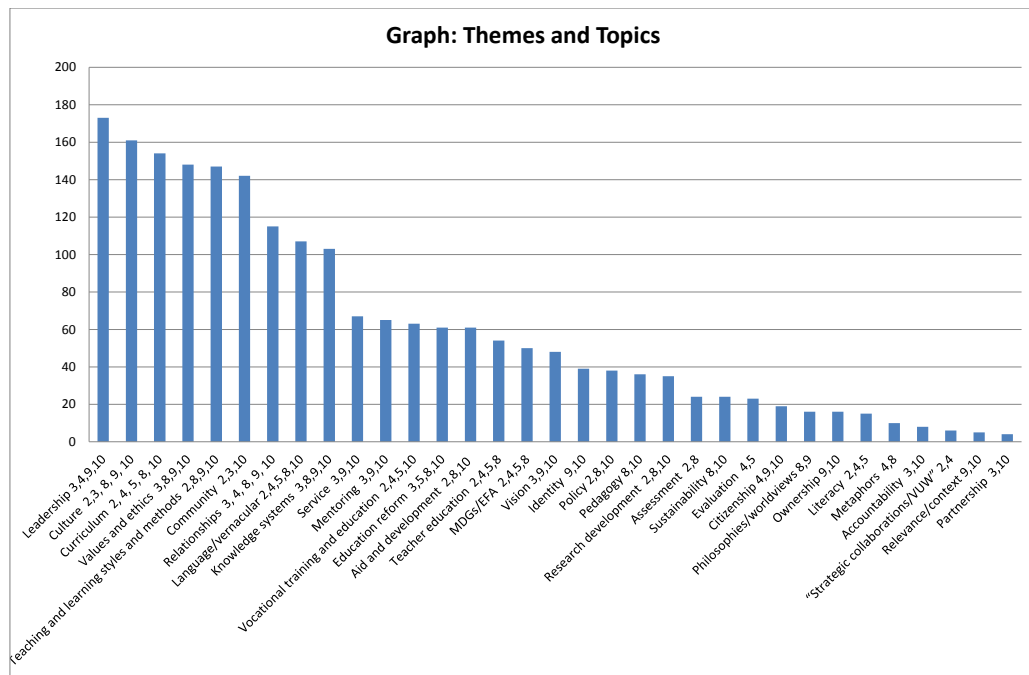
Content

As would be expected, the titles indicate the primary focus and purpose of each of the books – for example the nature of aid relationships and impacts on Pacific education (Sanga, Chu, Hall, & Crowl, 2005; Sanga & Taufe'ulungaki, 2005), curriculum issues (Sanga & Thaman, 2009), or leader development (Sanga & Walker, 2005) – and, of course, they are all about education in some way.

To identify main themes across the books, we explored tables of contents, prefaces, forewords, cover blurbs, and introductory and concluding chapters, where the editors had already identified the main themes of individual texts. These were collated; then, as a triangulating exercise, we checked the collated themes against the index entries of the seven texts that contain indexes. It was not very sophisticated methodology, and in fact, involved a simple tally of entries to establish a picture of the main themes.

While we were doing this, we reflected on what themes we might expect in a collection of books about rethinking education in a Western context. Based on what we see and hear in the news, in Aotearoa New Zealand, these would probably be about increasing tertiary education numbers, improving outcomes for underachieving groups, matters relating to equality and keeping up with other OECD countries, private versus public schools, and funding. Some of these concerns are also covered in the reviewed books of course, but the primary themes of the RPEIPP/Vaka Pasifiki literature are very different—Leadership, culture, community, relationships, vision and ethics (see figure 1.).

Figure 1



Exploring the indexes also revealed a great many more topics, showing the breadth of material covered in these books. Collating these involved a great deal more counting. To reduce it to a manageable number required the establishment of some selection criteria. To be included as a theme, topics had to have a minimum of seven references in at least one single index and to appear in more than one index. These criteria, although somewhat arbitrary, generated 116 topics. However, even at a glance it was clear that this fell very short of representing the breadth of topics covered. Further counting to include those with more than seven entries that appear in just a single index increased the number of topics to 175.

However, even this extended number falls short of the full list of topics. “Poverty”, for instance, does not qualify for inclusion because it falls short of seven references in any one index. However, the term poverty appears in six of the seven indexes, clearly making it a theme of these books. There are sure to be other examples like this. Furthermore, because four of the eleven books do not have indexes, the list of topics identified cannot in any way be regarded as finite. However, despite these

shortcomings, the analysis shows that a very diverse range of topics are contained in these eleven books.

Process

The second focus of the review concerned process matters and addressed the question of how the books got produced and who contributed. The analysis indicates that the processes used to generate this literature have been innovative, democratic, and inclusive, and that deliberate strategies such as mentoring and reciprocal engagement have been employed to ensure this.

Starting with Pene, Taufe‘ulungaki, and Benson (2002), most of the texts have been generated from presentations made at Rethinking Pacific Education and Vaka Pasifiki gatherings. For example, “Of Waves, Winds and Wonderful Things: A Decade of Rethinking Pacific Education” (‘Otunuku, Nabobo-Baba, & Johansson Fua, 2014)—launched at the second Vaka Pasifiki education conference in Tonga in 2014—comprises papers from the first of the Vaka Pasifiki conference series in Fiji in 2011. Similarly, the most recent RPEIPP/VP book (Toumu‘a, Sanga, & Johansson-Fua, 2016), launched in conjunction with this conference in Honiara in 2016, comprises a selection of papers from the second Vaka Pasifiki conference in Tonga in 2014. Such a publication has become more or less expected as an outcome of Vaka Pasifiki events. Thus this section of the paper necessarily reflects the relationship between the RPEIPP/VP events and the books.

Contributors to the texts range from specially invited prominent expert Pacific educators (Pene, Taufe‘ulungaki, & Benson, 2002; Sanga, & Taufe‘ulungaki, 2005), to post-graduate (Sanga, & Chu, 2009) undergraduate (Chu, Rimoni, & Sanga, 2011) students, to “first timers” – in-country researchers who have been assisted and mentored to research and write about what they know (Maka, Johansson-Fua, & Pene, 2006; Sanga, Niroa, & Crowl, 2004).

For emerging researchers in particular, there are challenges in attending training workshops, conducting research, making presentations, and writing papers. As well as being rewarding, it can also be lonely and intimidating at times. So, mentoring has been a deliberate and very important part of the process. Senior and experienced academics and researchers have run workshops and provided support for new researchers and writers. They have organised conferences where people can make presentations about their work, and they have arranged for works to be published. Through these publications, people’s hard work are honoured, preserved, and shared.

Another inclusive strategy, for both the conferences and the books, has been deliberate reciprocal engagement. Pacific peoples have been “in charge”, but have welcomed colleagues and others from elsewhere to both contribute and learn. This strategy has clearly worked. For example, 250 people were registered to attend the Vaka Pasifiki Education Conference in Tonga in 2014, and on opening day 350 people arrived. For the 2016 Vaka Pasifiki Education Conference in Honiara, the original intention was to cap the numbers at 350. However, this goalpost continued to shift in response to interest with the final number of registrations being 550; the great majority being Pacific Islanders and over half of the presentations from Solomon

Islanders. It seems that when Pacific people are in charge, Pacific peoples will come and willingly participate.

The analysis also indicates the developmental nature of the gatherings and the resultant books. They are written to motivate and inspire. For example, undergraduates' contributions to "Tok Piksa" (Chu, Rimoni, & Sanga, 2011) were inspired by the leadership stories in "Living and Leaving a Legacy of Hope: Stories by New Generation Pacific Leaders" (Sanga, & Chu, 2009), and this was deliberate. Significantly, the terms used in relation to RPEIPP/VP have changed over time: a "ripple" became a "wave", and the rethinking "initiative" has become the Vaka Pasifiki "movement". Correspondingly, perhaps reflecting this growing confidence, the contributions have become more solutions-focused, and the more recent research-based books have undergone a thorough peer review process; this was not the case with all of the earlier publications.

Discussion

The publications comprise a key impact of RPEIPP/VP activity (van Peer & Abella, 2014). The analysis shows them to be rich resources in terms of both content and what their existence represents. As well as being able to entertain, to inform, and to make us think, these books are important because they are timely, inclusive, unique, and innovative.

They are timely because there has been a long wait for this body of literature. Many who work in Pacific education have observed the impacts of these texts. From our own work it is clear that postgraduates, in particular, and others both within New Zealand and throughout the Pacific region, look to these resources. Evidence of this is that the texts are increasingly cited in academic writings related to Pacific health, development, and education. Their impact is clear, and growing.

They are inclusive because they transcend boundaries. They are relevant both within institutions and in the wider community. They are relevant within New Zealand and throughout the Pacific region. They encourage and hearten Pacific Islanders, students and educators, and they usefully inform those who are truly committed to doing more than tick the box when it comes to improving outcomes for Pacific students.

The resources are unique and innovative. They are written by Pacific people, for Pacific people and those working in Pacific contexts; they confront Pacific contexts and issues, and seek solutions for these; and they utilise Pacific knowledges and research approaches. An editor of one of the books notes that contributions have an "urgent significance", address "some high-stakes problems", and that "the authors can be thought of as navigators of the realms of the mind" (Sanga & Kidman, 2012, pp. 232-233). The books, then, may be regarded as a contemporary manifestation of that most traditional role of the university – a place where it is safe to question, challenge, and extend "standard" thinking. Given the priorities of the contemporary academic environment it perhaps takes more courage to do this than in former times. It may also require more courage, too, for those in positions of power to encourage, support, or accept the risks involved in making such challenges. As such, these collective works may be regarded as tangible examples of epistemic decolonisation.

In conclusion, the review indicates a number of things related to the conference streams: things to keep doing, to stop doing, and to start doing. By continuing to develop, refine, and utilise the many Pacific approaches, frameworks, and methodologies that have emerged, Pacific scholars can stop explaining and justifying Pacific research solely in terms of Western approaches. By continuing to explore and write about the things they know about, Pacific (and other) researchers, educators, and commentators can stop lamenting that there is no relevant literature to inform their writings about Pacific issues. By continuing to mentor, others are motivated and inspired to start exploring, researching, and writing about their own contexts – to develop, refine, and utilise Pacific research approaches, and so on. Thus “gaps” in the literature may be perceived not just as a deficit, but as an opportunity to keep doing.

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Home Economics – Still a Practical Subject? A case study of first year students' perceptions

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Abstract

The essence of Home Economics is its practical nature. Amidst issues of non-availability of specialised classrooms, inadequate resources, increased enrolments, incompetent teachers, time constraints, and making it a compulsory teaching subject at secondary levels, is Home Economics still taught with a practical focus?

To find out the answer, a case study of 46 first-year Home Economics students at the Solomon Islands National University (SINU) was undertaken. Specifically, the study explored the perceptions of students about the teaching of Home Economics in Solomon Islands secondary schools. Study respondents were asked about their experiences of how they themselves had been taught Home Economics in secondary school. Particularly, the study sought the students' perceptions about the practical nature of the teaching they had received. A prepared questionnaire was administered to all students, followed by two focus group interviews of 4-6 students each. The focus group interviews explored, in depth, some of the issues raised in the questionnaires.

This paper addresses the conference theme, "Education for What?" by delving into the practical aspects of Home Economics teaching. Findings of this study will inform best practice, and provide a guiding framework for policy makers in ensuring the issues above are addressed effectively so that teaching of Home Economics in secondary schools, technical vocational and education training (TVET), rural training centres (RTC) and SINU maintains a practical focus. Suggestions related to policy, curriculum, teacher training, and research are made.

Keywords: Home Economics, teaching, practical, Solomon Islands

Introduction

Circumstances and situations surrounding the teaching of Home Economics (HE) may vary from teacher to teacher, school to school, and country to country. But one thing remains constant: Home Economics is a practical subject. Whether this remains the case in Solomon Islands (SI) secondary schools, is the question underlying this study.

The theme for the third Vaka Pasifiki Conference, "Education for what? Revisited", held at the SINU, SI was fitting for HE education. Historically, in SI, practical subjects including HE were introduced by colonial governments (Chiweshe, Xavier, Cryton, & John, 2013) with a purpose that must be revisited, so that HE is taught as it should be.

Over the years, the teaching of the practical aspects of HE in SI secondary schools have been compromised due to a number of factors. These include issues of non-availability of specialised HE classrooms; inadequate resources, including learning and teaching materials, basic equipment and facilities, and finances; increased

enrolments; poorly trained teachers, and time constraints. Compounding matters, as a result of its recent curriculum review, the SI Ministry of Education and Human Resources (MEHRD) introduced compulsory HE into secondary schools (Solomon Islands National Curriculum Statement, 2010).

This study was motivated by the desire to find out whether all the prescribed practical components in the National HE Syllabus are covered thoroughly in schools as required.

Literature Review

The Solomon Islands National Curriculum Statement (SINCS, 2010) and Alabi (2013) define HE as a practical or a vocational subject. Wanyama (n.d. cited in Chiweshe, et al., 2013) states that practical subject are those “where a student uses both the hands and the brain to acquire life-long skills” (p. 890). Furthermore, practical is “concerned with norms or values as standards socially accepted as authoritative or justifiable with a technical perspective” (Brown 1993, cited in Kunkwenzu, 1997, p.74).

Vocational subjects equip learners with “saleable skills” that make them self-reliant and potentially self-employed (Bamalli, 2013, p. 105). HE is “practically oriented and skill based” (Arubayi, 2014, p. 8), “play[ing] vital roles in the development of national economy through quality teaching and learning of skills” (p. 7). This very important subject, when “properly funded and taught[,] will lead to the acquisition of entrepreneurial based skills, saleable skills, life skills needed for self-reliance or paid employment in industries or other government parastatals” (Arubayi, 2014, p.8). Thus, the goal of HE as a vocational subject is to “equip students with all the pertinent practical knowledge and social skills necessary for them to take a productive role in the economy” (Alabi, 2013, p. 49). However, a number of challenges exist in relation to HE education.

Firstly, due to its practical and vocational nature the teaching and learning of HE is most effectively done in adequately resourced specialised classrooms in which “the subject matter is relevant learning is exciting and students are supported and encouraged to acquire new knowledge” (Uwameiye, 2015, p. 2155). Poor student performance is the result of poor laboratories and uncondusive classrooms (Koreau, cited in Uwameiye, 2015). Therefore, the teaching and learning of HE remains challenging when schools lack specialised classrooms and adequate resources (Manwa and Motsi, 2010).

Secondly, in developing countries, the adequacy and sufficiency of resources in schools are often determined by student enrolments. In schools with high enrolments resources are likely to be limited, making teaching and learning challenging. According to Arubayi, (2014, p. 9), “no practical skills can be acquired without practical exposure to learning experiences” and students cannot be expected to acquire practical skills without practical experience.

Thirdly, practical skills cannot be acquired when schools do not have the finances to pay for consumables. HE is a capital-intensive subject, and its demand for finances is great. Usually, practical subjects are not adequately budgeted for (Arubayi, 2014;

Chiweshe, Xavier, Cryton, and John, 2013) and, as a result, students and parents incur additional costs over and above the school fees to pay for materials.

Fourthly, HE requires competent well-trained teachers to teach it because the teacher implements the curriculum, and facilitates the learning for the benefit of students and society (Alabi, 2013; Bamalli, 2013; Ofem, Iyam & Bassey, 2015). As noted by Ofem, et al., (2015, p. 37), “teachers are the hub of the educational system”; this can be applied in the context of imparting practical HE skills and knowledge to students in the SI. Therefore, teacher training courses must be structured in such a way to teach content and skills for mastery and competency.

Leaving the above issues unaddressed has detrimental effects on individuals, and on HE as a subject with flow-on effects for the economy of the SI. Thus, it is urgent to look closely at these issues and to address them.

The study

Statement of problem

Since 2013, SI has implemented a compulsory HE syllabus into its secondary schools. This was not because of a decline in enrolment, but because of the importance of basic education to both genders (SI Education Strategic Framework 2007-2015, 2007). It was envisaged that basic education provided all the basic skills and knowledge to make a living, and HE is one of the practical subjects containing necessary basic skills for survival.

However, given the issues outlined above – lack of specialised classrooms, inadequate teaching and learning material resources, insufficient funding, poorly-trained teachers, increased student enrolment, and time constraints – how have the practical aspects of HE been taught in SI schools? How prepared are schools and the SI government to address these issues to ensure the teaching and learning of HE maintains a practical focus?

Purpose and scope of the study

The purpose of this study was to explore whether HE teaches the practical and entrepreneurial skills that it is supposed to. Study participants included 46 (all female) first year HE students studying at the SINU in 2016. Their perceptions were sought based on experiences of how they, themselves, had been taught the practical aspects of HE.

Research question

The major underlying research question for this study was: Is HE still taught with a practical focus in Solomon Islands secondary schools?

Methodology

The research design used was a case study. The population of this case study was 46 first year HE students studying at the SINU in 2016.

This study used a questionnaire to collect data. Three of the 17 items sought student demographic information, two were about having a specialised HE classroom, seven on teacher competency, two on learning and teaching resources, one on enrolment, and two on time constraints. The questionnaire was self-administered to students in class and collected at the end of class.

Focus group interviews were also conducted. Two focus groups with five students in each were conducted on separate dates for two hours each. Ten items were used to solicit data. The interviews were recorded and later transcribed and thematically analysed.

Findings and Discussion

Nineteen of the 46 participants had done HE up to year 12 (Form 6), 24 of them up to year 11 (Form 5), two attended RTC after completing year 9 (Form 3), and one student's highest level of HE education was year 7 (Form 1). These students did their HE education in seven of the 10 provinces in the SI.

There are three types of secondary schools in the SI: Community High School (CHS), National Secondary Schools (NSS), and Provincial Secondary School (PSS). The only difference between the types of secondary schools lay within the purposes for which they were established, but all use the same National Curriculum for all subjects including HE.

The findings of this study are discussed under the following issues and themes: non-availability of specialised HE classrooms, inadequate resources and increased enrolments, incompetent teachers, and time constraints.

Non-availability of specialised HE classrooms

Thirty-nine (85%) of the 46 participants confirmed that the secondary schools where they had done HE had specialised HE classrooms. Five (11%) attended schools without specialised HE classrooms. The remaining 2 (4%) students did not respond to the question.

In the case of the 11% that did not have specialised HE classrooms, some used ordinary classrooms while others used the science lab for HE classes. Thus, no practical work was done when these classrooms were used for HE classes.

Based on the findings of this case study, then, a high percentage of schools in SI have specialised HE classrooms.

Inadequate resources and class numbers

Findings revealed that not all of the specialised HE classrooms were equipped with adequate learning and teaching resources, basic equipment and facilities, and finance.

Table 1 below is based on the responses of 39 (85%) students who confirmed having specialised HE classrooms at their secondary schools.

Table 1: Rating of HE resources in SI secondary schools with specialised classrooms

Satisfaction Level	Schools	CH S	NSS = 6	PSS = 3	CHS/ NSS = 5	CHS/ PSS = 8	NSS/ PSS = 1	CHS/NSS /PSS = 3	Total & %
		= 13							39 (100%)
Excellent		4	2	1	2	5	0	1	15 (38.5%)
Very Good		6	2	1	1	2	0	1	13 (33.3%)
Satisfactory		1	1	1	1	1	1	1	7 (18%)
Fair		2	1	0	1	0	0	0	4 (10.2%)

Fifteen (38.5%) of the 39 students stated that the resources were excellent, 13 (33.3%) rated them very good, 7 (18%) satisfactory, and 4 (10.2%) as fair.

However, it was revealed that the few schools with excellent resources faced a challenge of proper storage. In addition, HE teachers tend to remove resources for personal and family use without returning them. Furthermore, increased enrolment also appears to have had an impact on resources, especially at Junior Secondary School where HE is compulsory for all female students. In such situations, some teachers resorted to group work for practical lessons, which was ineffective for imparting skills to individual students. At Senior Secondary School level, there were adequate resources because fewer students took HE. However, now that it has become compulsory, the experience of inadequate resources remains a challenge. Students confirmed that in the cases where there were no resources no practical classes were done. The teacher simply demonstrated while students watched and were expected to apply the skills they had observed sometime in the future.

The data showed that HE class sizes varied enormously: 44% of students had 10-19 students in their HE classes, 35% had 20-29 students per class, 13% had 30-39 students per class; 2% 40-49 students; 4% had an average of 50-59 students.

In terms of funding, the extra cost was often placed squarely on the students and their parents/guardians. Thirty-four of the 46 participants (74%) confirmed that they had incurred extra costs to pay for fabrics, sewing accessories, and ingredients in order to do practical lessons.

The most important resource in the face of challenges, such as inadequate resources, is the existence of committed teachers. These individuals went out of their way to ensure that practical aspects were taught to students. When the need arose, they sacrificed their small earnings to pay for materials to make sure practical lessons were conducted. They used their own kitchens to conduct practical cooking classes, or they asked students to bring in kitchen equipment and utensils from home for practical lessons. However, such teachers are scarce and hard to find.

Incompetent teachers

Teacher's sole responsibility is to impart skills and knowledge to students. Clearly, if they are inefficient, vital skills and knowledge will not be effectively imparted to

students. As a result, the goal of HE to “equip students with all the pertinent practical knowledge and social skills necessary for them to take a productive role in the economy” (Alabi, 2013, p. 49) will not be fully realised. This study revealed that teacher competency was affected by a number of factors which may be summarised as subject matter context and teacher-demographic variables (see Berliner and Leinardt, 1986, cited in Kunkwenzu, 1997; Ofem, Iyam, and Bassey, 2015).

In terms of subject matter context relating to teacher competence, the findings of this study revealed that teacher training courses have an impact on teacher competency. If the training does not equip teachers with content and skills, it will reflect on how and what teachers teach students. Thus, teachers could become stumbling blocks to students acquiring skills in HE.

Another factor perceived to affect competence was gender. It was found that, while some male teachers strived to teach practical skills to students and did it excellently, many could not teach the skills of HE with competence.

Table 2 shows the students’ rating of the HE Teacher Competency Level on teaching of theory and practical aspects.

Table 2: Teacher competency level in HE theory and practical content

Competency Areas	Number of Students	Percentages
Competent in Theory Only	4	8.7
Competent in both Theory and Practical	37	80.4
Incompetent in both Theory and Practical	4	8.7
Incompetent in Practical Only	1	2.2
Total	46	100%

The study revealed that 37 students perceived their HE teachers were competent both in theory and practical components. Four thought their teachers were competent in theory only. Another four felt that their HE teachers were incompetent in both theory and practical, with only 1 student stating that their HE teacher was incompetent in practical only. Therefore, 80.4% of HE teachers were perceived to be competent, and only 19.6% incompetent.

Table 3 shows another aspect of teacher competency investigated in this study based on the teachers’ coverage of HE theory and practical components.

Table 3: HE theory and practical content coverage in secondary schools in SI

Percentage of Theory and Practical Coverage	Number of Students	Percentages
100% theory	2	4.4
40% theory & 60% practical	10	21.7
50% theory & 50% practical	22	47.8
60% theory & 40% practical	12	26.1
100% practical	0	0.0
Total	46	100

When asked to rate how HE had been taught to them, 22 (47.8%) students confirmed that it was taught with a 50% theory and 50% practical coverage; twelve revealed that they experienced 60% theory and 40% practical; ten estimated 40% theory and 60% practical; two confirmed receiving 100% theory. In all, a total of 44 of the 46 students confirmed receiving teaching and learning that was practical in nature. This confirmed that HE teachers understood the goal of HE education and made sure that goal was achieved with the limited resources available.

Time constraints

HE was classified as an elective or optional subject in SI secondary schools. As such, it was usually timetabled for three periods in a week while academic subjects take up 6-8 periods a week. Of the three periods, one is a single 40-minute period and the other a double period of 80 minutes. Some students in the study indicated that their schools had four periods; two single and one double period of 40 minutes per period. Even in these cases however, the time was inadequate to cover both the practical and theory aspects of HE.

The study revealed that HE teachers and students had to use public holidays, semester breaks, weekends, and study periods at night to complete practical tasks, especially senior secondary students because of the requirements for the School Based Assessments (SBA). In the SI, students taking HE are required to do SBA in years 10 and 11 (Forms 4 and 5). These tasks are additional to what is prescribed in the syllabus. With the limited time, teachers and students struggled to complete the required assessments and prescribed HE syllabus. Coupled with time is the issue of student enrolment. Catering for large numbers of students with limited time is a continuing issue. Clearly, if practical skills and knowledge are to be effectively imparted to students there is a need to increase the numbers of class periods.

Conclusion

The teaching and learning of HE with a practical focus remains a challenge for HE teachers, schools, and the government of SI. Although it is clear that some teachers and schools try their best to teach HE with a practical focus, others appear to give up when faced with no resources and incompetent staff. For students to become equipped with the skills necessary for self-reliance and self-employment, and to be able to contribute to the economic growth of the country, the SI government, through the MEHRD and other education stakeholders, must address these outstanding issues so that the education of SI realises its vision.

Recommendations

These recommendations are made based on the findings:

- a) Equip schools with adequate and quality teaching and learning resources
- b) Post newly-graduated HE teachers to schools with experienced teachers for mentoring
- c) Facilitate team teaching and collaboration between specialised and experienced teachers
- d) Charge appropriate fees for practical subjects like HE

- e) Budget sufficient funds for practical subjects like HE
- f) Offer HE education only in schools with HE classrooms, competent teachers, and adequate resources
- g) Allocate adequate class time for teaching and learning of HE
- h) Incorporate basic HE skills and knowledge in the senior primary school curriculum
- i) Organize yearly professional development workshop for HE teachers
- j) Lengthen teacher training courses to ensure practical competency and mastery.

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Students' Motivation towards Learning Chemistry

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Abstract

Students' motivation depends on their curiosity in the course, and a desire to achieve motivates them intrinsically. How students learn and the influence others have on their learning and choice of career are variables that affect students' motivation towards learning chemistry. The motivation questionnaire used in this study aims to measure students' motivation towards learning chemistry within the three subheadings: chemistry learning value, performance goals, and achievement goals. The self-completion questionnaire (14 questions) used in this study was administered in four different schools (S1, S2, S3, & S4) with eight different year 10 classes (C1, C2, C3, C4, C5, C6, C7, & C8). The purpose of this study was to determine what motivates and what inhibits students' chemistry learning. In order to determine student motivation towards learning chemistry, the questionnaire was administered to 258 high school students. From the study, the students' motivation toward learning chemistry is heavily intrinsic as opposed to being extrinsically driven. Investigating the nature of student motivation towards learning chemistry in this study can help teachers and instructors to understand student motivation, since student motivation affects students' learning strategies and their attitudes towards learning chemistry.

Keywords: Motivation to learn, chemistry, high school students.

Introduction

This paper is focussed on chemistry students in Solomon Islands secondary schools. It presents students' views on their motivation for chemistry learning, their performance goals, and academic achievements.

Statement of Issue

I have had numerous encounters in my past sixteen years of teaching chemistry in which the capability of students to pursue further studies in chemistry declines as they move through the formal education system. The ability to build a firm belief in students (motivation) to overcome their fear of failing (attitude) in studying chemistry sparked an interest in me, and led me to pose questions to gather information about the nature of students' motivation towards learning chemistry.

Research Purpose and Objectives

The aim of this paper is to present research findings on year 10 students' motivation toward learning chemistry. This can then be used to help understand the nature of motivating learners in chemistry learning environments. The purpose and objective of this paper is to provide insights into alternative ways of teaching and learning contextual chemistry that will motivate students towards learning chemistry.

Research Questions

The research questions addressed in this paper are:

1. What motivates students to learn chemistry?
2. What inhibits student motivation towards learning chemistry?
3. What association is there between student motivation, attitude, and self-efficacy in learning chemistry?

Methodology Overview

For this research, a mixed method research approach was used. The methods used were a survey, using the Student Motivation towards Learning Chemistry questionnaire comprising 18 items with scales and sub-headings (Chemistry Learning Value, Performance Goals, and Achievement Goals Towards Learning Chemistry), and semi-structured focus group interviews. The self-completion questionnaire used in this study was administered in four different schools (S1, S2, S3, & S4) with eight different year 10 classes (C1, C2, C3, C4, C5, C6, C7, & C8). The sample size was 258, and the students were between 14 and 15 years of age. The quantitative data were analysed and are described along with the qualitative data.

Data Results and Analysis

This section outlines the results and analysis of the study data. There are three basic data analysis techniques used to analyse the data collected. They are:

1. cross tabulation of the quantitative data;
2. use of Analysis of Variance (ANOVA) to check the validity and reliability of the study results; and
3. thematic analysis of focus group transcripts.

Cross Tabulation of the Quantitative Data

Presented below is the quantitative data obtained from the survey questionnaire used. The findings are presented within the study questionnaire framework of scales/items; Chemistry learning value; performance goal; achievement goal; toward learning chemistry.

Table 1.0: Student Motivation toward Learning Chemistry, Cross Tabulation Results

		MOTIVATION TOWARDS LEARNING CHEMISTRY								
		RATING SCALE + STUDENT RESPONSES								
(N _{total} = 258)										
ITEM	SCALES	SA	A	NA	D	SD	Tot.	MEA	STDE	
		1	2	3	4	5	n			
		n	n	n	n	n	n	N	V	
		(%)	(%)	(%)	(%)	(%)	(%)			
A. CHEMISTRY LEARNING VALUE										
1	<i>Relevance of Chemistry to everyday life</i>	99	124	30	4	1	258	1.78	0.38	
		38	48	12	2	0	100			
2	<i>Learning Chemistry stimulates thinking</i>	96	126	23	8	5	258	1.84	0.36	
		37	49	9	3	2	100			
3	<i>Learning Chemistry to solve problems</i>	106	104	30	1	3	258	1.86	0.28	
		41	40	12	6	1	100			
4	<i>Participation in experimental activities is important in Chemistry</i>	196	55	6	1	0	258	1.27	0.33	
		76	21	2	0	0	100			
5	<i>Learning Chemistry & curiosity</i>	113	101	30	9	5	258	1.81	0.28	
		44	39	12	3	2	100			
Average Mean & STDEV values								1.71	0.32	
B. PERFORMANCE GOAL FOR LEARNING CHEMISTRY										
6	<i>Do Chemistry to get good grades</i>	86	104	46	2	2	258	2.02	0.29	
		33	40	18	8	1	100			
7	<i>Do Chemistry to do better than other students</i>	48	70	63	5	21	258	2.74	0.27	
		19	27	24	6	8	100			
8	<i>Do Chemistry so others think I am smart</i>	15	42	45	8	71	258	3.60	0.60	
		6	16	17	5	28	100			
9	<i>Do Chemistry to gain teacher's attention</i>	19	29	52	8	77	258	3.65	0.62	
		7	11	20	1	30	100			
Average Mean & STDEV values								3.00	0.44	
C. ACHIEVEMENT GOAL FOR LEARNING CHEMISTRY										
10	<i>When I get good grades, I really achieve my goal in Chemistry</i>	137	82	25	1	3	258	1.69	0.24	
		53	32	10	1	1	100			
11	<i>I gain confidence in content when I achieve my goal in Chemistry</i>	87	128	31	9	3	258	1.89	0.37	
		34	50	12	3	1	100			
12	<i>In solving difficult Chemistry problems, I achieve my goal</i>	117	94	28	1	3	258	1.81	0.25	
		45	36	11	6	1	100			

13	Teachers' acceptance of my ideas means I achieve my goal.	81	116	39	1	4	258	2.02	0.31
		31	45	15	7	2	100		
14	Students accepting my ideas means I achieve my goal in Chemistry	63	108	52	2	11	258	2.27	0.26
		24	42	20	9	4	100		
Average Mean & STDEV values								1.94	0.29

Key:

SA = Strongly Agree, **A**= Agree, **NAD** = Neither Agree nor Disagree, **D** = Disagree, **SD** = Strongly Disagree,

STDEV = Standard Deviation (Misitom, 2012).

Analysis of Variance (ANOVA)

Table 2.0 below presents reliability data for the study questionnaire. The Cronbach's Alpha ranges from 0.97 to 0.99, indicating that the questionnaire used is reliable.

Table 2.0: Reliability Summary Data (Cronbach's Alpha for the Student Motivation Towards Learning Chemistry, (n=258)

	Scale Name	No. Of Items	Reliability Statistics *Cronbach's Alpha
A	Chemistry Learning Value	5	0.97
B	Performance Goal	4	0.97
C	Achievement Goal	5	0.98

*Cronbach's Alpha – coefficient of reliability, a measure of the internal consistency or reliability of the measuring instrument used for the sample examined (Misitom, 2012).

Table 3.0 below presents the scale mean and standard deviation data for the study questionnaire used in this research.

Table 3.0: Scale Means and Standard Deviations Data for (Student Motivation Towards Learning Chemistry, n=258)

	Scale Name	No. of Items	Scale Statistics			*Grand Mean
			Mean	Variance	STDEV	
A	Chemistry Learning Value	5	8.55	14.31	3.78	1.71
B	Performance Goal	4	12.01	19.74	4.44	3.00
C	Achievement Goal	5	9.68	20.14	4.49	1.94

* Grand Mean – is the average mean for each of the scales respectively (Misitom, 2012).

Focus Group – Thematic Analysis

Presented on the next page (Table 4.0) are the thematic analysis data obtained from the focus group interview conducted (Misitom, 2012).

Table 4.0: Summary of Findings for the Student Motivation towards Learning Chemistry Focus Group Interview

<i>Themes</i>	<i>Concepts (Question no)</i>	<i>Description</i>	<i>Comments</i>
A. Chemistry Learning Value	Importance of chemistry in life (1)	Extent to which students see the importance of chemistry in life.	<ul style="list-style-type: none"> • Chemistry is seen as important in life because all material is made up of atoms and what, why, and how these materials are made can be known through chemistry. • The abstract nature of chemistry problem solving stimulates student's thinking. • Students value group and active participation in chemistry as a way of satisfying student curiosity in chemistry.
	Stimulate thinking to solve problems (2,3)	Extent to which students' thinking is stimulated by chemistry problem solving.	
B. Performance Goal and Chemistry Learning	Active participation, satisfying one's own curiosity (4,5)	Extent to which students see the opportunity to be actively involved in chemistry learning	<ul style="list-style-type: none"> • Students aim to obtain higher grades just for the sake of passing exams. • Students view attaining higher grades as depending entirely on the individual learner and their choice of learning strategies. • A personal assessment on one's learning would enhance and promote a positive self-image which, in turn, would result in higher performance next time.
	Doing chemistry to attain good grades (6,7)	Extent to which students perform to get high grade attainment.	
	Performance as an individual construct (8)	Extent to which performance is seen as depending on the individual learner.	
C. Achievement Goal and Chemistry Learning	Self-image of performance in view of others (9)	Extent to which performing a task is a measure of how well one performs against oneself.	
	<i>Themes</i>	<i>Description</i>	<i>Comments</i>
	<i>Concepts (Question no)</i>		
C. Achievement Goal and Chemistry Learning	1. Academic attainment as achievement goal (10)	Extent to which students attain higher grades using effective strategies.	<ul style="list-style-type: none"> • Students' perceive that when they obtain higher grades in chemistry they achieve their goal. • Solving chemistry problems and gaining confidence in the content knowledge are seen as achievement. • Achievement is seen as the application of knowledge gained in chemistry to real life situations.
	2. Problem solving & confidence as achievement goal (11,12)	Extent to which students solve problems and gain confidence with content knowledge.	
	3. Applying content knowledge & sharing of ideas as achievement goal (13,14)	Extent to which students apply their content knowledge in real life situations.	

Discussion

Research on student motivation, attitudes, and self-efficacy suggests that prior beliefs can change with new information presented within students' current beliefs, attitudes, and experiences (Areepattamannil et al., 2011; Bandura & Locke, 2003; Bannier, 2010; Britner, 2008; Dalgety, 2003; Reid, 2007). The study findings here highlight that to change an individual's motivation, the teaching of chemistry must be seen by students as worthwhile, and related to the individual's own beliefs and attitudes.

Student motivation towards learning Chemistry

Motivation here is defined as having a desire and energy to be continually interested in and committed to exerting persistent effort in attaining a goal (Areepattamannil et al., 2011; Bannier, 2010; Benton, 2010). The three areas of motivation that are addressed in the study (Chemistry Learning Value, Performance, and Achievement Goals) indicates that students' motivation was influenced by their perception of themselves as learners, the process of learning (how they learn), and the influence others have on their learning. The research findings also identify similar motivational patterns to those reported in the literature (such as in Dalgety, 2003; Martin, 2003; Reid, 2007).

Firstly, students' need to achieve motivates them to pursue learning chemistry. As such, students strive to attain higher grades. Such students are said to be performance goal oriented (Martin, 2003). In particular, students perceived that gaining higher achievement was a prerequisite to achieving personal growth. Geo stated: *"In Chemistry, I do find my motivation by seeing my friends doing their studies and obtaining good grades. This motivates me to do the same."* (Misitom, 2012). This is similar to other research findings conducted by Vedder-Weiss and Fortus (2011), who say that this perspective is behavioural. Unlike Vedder-Weiss and Fortus' (2011) findings, there is no emphasis placed on incentives and reinforcement, since students' need to achieve becomes the motivating factor.

Secondly, the findings indicate that students' choice of career is an antecedent for their need to achieve, and that they are motivated intrinsically. Intrinsic motivation refers to behaviours performed out of interest and enjoyment (Ryan & Deci, 2000). Gigs, for instance, stated that:

"To me, science in general and chemistry in particular, is my most loved subject. I treat chemistry as I love it and that I do motivate myself to learn chemistry. This is because I want to be a medical doctor in the future. This motivates me and makes me love chemistry." (Misitom, 2012).

In contrast, extrinsic motivation refers to behaviours carried out to attain contingent outcomes (Ryan & Deci, 2000). For example, whereas learning chemistry for its own sake is intrinsic motivation, to learn chemistry for the purpose of passing exams is extrinsic (Eccles et al., 2006).

Thirdly, students' desire to obtain knowledge about chemical constituents of substances motivates them to study chemistry. Motivations related to students' desire

to obtain knowledge about either difficult medical situations faced by members of their families, or their self-interest in discovering the environment by interacting with others, are particularly influential. Josephine for instance said *“I am motivated to study Chemistry because when I went to the clinics and hospitals I saw all this medicines and I am curious to find out what these medicines are made of”* (Misitom, 2012). Students with such a genuine interest in acquiring a better knowledge are said to be pursuing learning goals (Martin, 2003). Motivation, to these students, is rooted in the basic need to minimize physical pain with the intention to maximize pleasure and, thus, it is intrinsically driven (Areepattamannil et al., 2011; Bannier, 2010; Benton, 2010).

In addition, students prefer seeing, doing, and obtaining knowledge through individual, meaningful tasks as a measure of achievement, instead of a search for satisfaction through socialization. This is in contrast with other research (such as Dalgety 2003; Reid, 2007). The motivational focus as seen here centres on the individual, and is one way of interpreting and constructing knowledge based on past environmental and situational experiences (Raina, 2011; Sesen & Tarhan, 2010).

Finally, students gained motivation for learning chemistry by having a feeling of responsibility imposed by their peers and parents. This is what is referred to by other authors as a motivational influence on subjective norms (Dalgety & Coll, 2004; Schunk, Pintrich, & Meece, 2008; Vedder-Weiss & Fortus, 2011). Jojo, for instance, stated that, *“My parents are the ones who motivate me to study chemistry. They are the ones who encouraged me to study chemistry.”* Similarly, Alla stated that *“I was motivated by my brother who is a medical doctor, who encourages me to study chemistry by explaining how things work in our body”* (Misitom, 2012). In particular, students are internally aroused by external factors that affect the environment and their natural surroundings. This is consistent with other research and studies conducted, which argue that these external factors, in turn, lead to student action (see Tucker et al., 2003; Weihua & Williams, 2010).

Student motivational inhibitors in Chemistry

According to the research findings, students' motivations (Chemistry Learning Value; Performance Goal; and Achievement Goal) for learning chemistry can be inhibited by several factors.

Firstly, passive teaching strategies employed by teachers of chemistry, such as the teacher-centred chalk-and-talk approach, inhibits their motivation to study chemistry. Chemistry, according to the students, is about doing and being engaged actively in learning. Learning within the Solomon Islands culture (the Melanesian context) occurs in a socio-cultural setting, in which the young learn from their seniors and elders by actively doing what the elders practically demonstrate. Skilled experts demonstrate the desired behaviour by teaching the essential know how and skills through word of mouth and demonstration (Valence, 2007, 2008; Gegeo & Gegeo, 2002). Learning here occurs through observing others' behaviour, attitudes, the outcomes of those behaviours, and by doing. This is consistent with other findings (such as Bandura & Locke, 2004). Thus, students' prefer to carry out experiments and expressed their enjoyment of the stress-free learning atmosphere such an environment promotes.

Secondly, the teaching of chemistry abstract concepts should be contextualized, so students can easily visualise the concepts and understand. Seeing chemistry concepts as foreign to them hinders students from seeing the worth of what they have learned. This is also consistent with other research findings (see Sade & Coll, 2003; Toumu'a, Sanga & Fua, 2016).

Thirdly, the allocation of class times for chemistry affects student motivation. Students prefer chemistry classes that are held in the morning compared to those held in the afternoon. Students are fresh in the morning and much more attentive than later in the day when they are tired and lose concentration.

Finally, another inhibitor to their motivation centres on themselves, their interests, views, and previous experiences with similar topics. When students view topics as difficult, they are not motivated to pursue their studies. This is consistent with the literature, which stipulates that the belief in oneself determines one's functioning as a human being (Bandura, 1986; Banner, 2010).

Associations between student motivation and attitudes towards learning Chemistry

The findings suggest that there is a direct relationship between students' motivation and their attitude toward learning chemistry. Motivated students have a positive attitude toward learning chemistry. Students' curiosity and desire to achieve motivates them to have a positive attitude toward learning chemistry. This helps students set higher, achievable goals that can be achieved with a positive change of attitude. Achieving such goals encourages students by creating a desire to know more about the subject. Such findings are consistent with the literature (Hardre, Sullivan & Crowson, 2009; Hong, 2010; Reid, 2007; Yusuf, 2011). In addition, students are motivated when they see the worth of the Chemistry knowledge acquisition. This is consistent with other work (Reid, 2007; Tuan et al., 2005; Walker & Greene, 2009), in which it is reported that the values related to science subject matter have clearly recognizable influence on both science subject matter achievement and participation, and career choice.

Association between student motivation and self-efficacy in learning Chemistry

As previously described, goal setting and self-efficacy are influential on students' expectations and achievement (Jinks & Lorschach, 2003; Reid, 2007; Tuan et al., 2005; Yusuf, 2011). The qualitative findings indicate that students' motivation had a direct influence on their self-efficacy in learning chemistry. Students who are intrinsically motivated to study chemistry have acquired a sense of self-worth and confidence, and set goals that they can achieve and work towards. Such students are performance-oriented. Intrinsically motivated students, according to this study, are more outspoken and expressed enjoyment and excitement about acquiring knowledge and the sense of accomplishment it brings. This is consistent with previous studies (Barrick, Mount & Judge, 2001; Costa, McCrae & Martin, 2008; Hong & Lin, 2011; Martin, 2003) in which it was reported that extroverts tend to be talkative, assertive, and experience affects such as energy, zeal, and excitement. From this study, students

that are motivated and have high self-efficacy toward learning chemistry, often confidently share their knowledge with others, as compared with those who have less motivation and lower self-efficacy.

The study also highlighted that student motivation and self-efficacy for learning Chemistry can be enhanced by doing more practical work. Again, this is consistent with other research findings (such as Manaf & Subramaniam, 2004; Staver, 2007; Sterling & Frazer, 2008; Yusuf, 2011). In addition, students are motivated when the practical and investigative work is designed and carried out within the student context and environment (Brodie, 2006; Roscorla, 2009; Woodley, 2009; Yagenska, 2007; Zain et al., 2010). Such an engagement builds student confidence and aids the retention of knowledge and understanding of concepts in chemistry. Motivation, therefore, builds student self-efficacy toward learning chemistry.

Implications of the Study

The implications of this study are likely to be of interest to teachers, curriculum developers, and teacher educators. It is hoped that the findings provide valuable insight into Solomon Islands students' motivations for learning chemistry.

The findings have implications for our understanding of the socio-cultural factors that influence chemistry teaching and learning. Teachers need to be aware of the cultural influences that are associated with Solomon Islands culture and any other similar cultures. Primarily, they should be aware of the notion of respect and not challenging elders. It is likely to be beyond a teacher to change such notions, and indeed it is not necessarily appropriate that they should attempt to do so. However, what a teacher can do is to encourage students to understand that in the learning environment, such as schools, it is acceptable to speak out to challenge and clarify things. With such continual encouragement, students would be expected to develop a higher level of motivation for learning chemistry.

The findings may also inform curriculum developers, teacher educators, teachers and students. The collation of both quantitative and qualitative data specific to this study provides insights for educators who might wish to reflect on how learning within a chemistry year 10 classroom can be understood in terms of students' motivation.

Conclusion

According to the study, the desire and energy to be continually interested in pursuing the learning of chemistry was influenced by students' perceptions of themselves as learners, the process of learning - how they learn - and the influence others have on their learning. Students' own need to achieve, their choice of career, their desire to know about chemical substances, and encouragement by peers and parents became the motivating factor for learning chemistry. It is, however, highlighted that passive teaching strategies, non-contextualised teaching of chemistry concepts, and students' prior experiences can be inhibitors of motivation. It is, therefore, essential that teachers of chemistry communicate the knowledge within the field effectively and adapt to changes to the learning needs of students. By implementing changes that foster effective and worthwhile learning of chemistry within the classroom, chemistry

students' motivation can improve. This, in turn, should boost student learning and increase student sense of ownership of their learning of chemistry.

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Challenges of Early Childhood Services in the Solomon Islands: Managing a Fast-Growing Industry

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Abstract

Solomon Islands, with its fast-growing population and very high birth rate, faces challenges to educating and maintaining education services to its school-aged population. While such challenges are not uncommon, the perceptions and views that different countries undertake to deal with such issues may vary. A growing area of challenge is the sustaining and maintenance of services in the early childhood sector in the Solomon Islands. Part of this challenge is to do with the sporadic emergence of early childhood centres around the country, which begs questions such as who is to fund such important establishments and, in the long run, would funding from the central government be sustainable? This paper intends to contribute to the discourse of growing challenges in educating and sustaining education services to early childhood-aged children in Solomon Islands. It intends to highlight the challenges facing early childhood services in the country and proposes different pathways for going forward in this very important sector.

Keywords: population growth, early childhood education, challenges, funding, sustainability.

Introduction

The early years to children's life are vitally significant to their life and wellbeing. It has often been emphasised that a good beginning to life is the foundation for future development, health, and wellbeing, not only as children but throughout life (Elliot, 2006; Ginsburg, 2007; UNICEF, 2013). Despite this knowledge, many countries have a long way to go to fully appreciate the relevance of early years to the country's development. Further, considering its ultimate economic importance, often little recognition is given to this sector. The early childhood literature (see for example, Elliot, 2006; Sims, 2015) is replete with the very close connections between care and education, and the close association between development and learning. Therefore, given all of this, it may be argued that early childhood services should provide comprehensive developmental programmes for children in the 0–8 age group.

Early Childhood Education in the Solomon Islands started out as privately operated kindergartens in the 1970s. Makini (1987) referred to only six kindergartens run by private organisation and, supposedly, these were the only kindergartens in the whole country at that time; and all were based in Honiara. By the early 1990s, however, the majority of children throughout the country would make a start in the preparatory year (a year before going into primary). These were children who supposedly would have graduated from three years (ages 3-5 years) of early childhood education. However, during the period leading up to the 2000s, there was an increasing awareness of the significance of early learning. In 2008, the Solomon Islands government, through the Ministry of Education and Human Resource Development (MEHRD), structured itself to take on board the early childhood sector and introduced the Early Childhood

Education (ECE) policy. This policy paved the way for both early childhood teachers and registered early childhood centres to receive salary and grants from the government. While this undertaking has been seen to improve access to early childhood education for many children between the ages of 3 to 5 years, particularly within the rural communities, it has undergone major challenges as well.

Early Childhood Education in Solomon Islands

While ECE policy in Solomon Islands embraced much of the definition of what is internationally accepted as early childhood education, it was limited in its perspective and approach (MEHRD, 2008). For example, Ball's (2015) report emphasises that the Solomon Islands ECE policy takes a narrow view of what early childhood education represents. Inevitably, such a view encompasses a more basic approach to early childhood learning, which perhaps is borrowed from the mainstream education currently practiced in schools in the Solomon Islands—a teacher-centred approach. Ball (2015) suggests that this approach is focused on success in schooling, whereby a child is merely being tutored to enter primary schools.

According to UNICEF (2006), “Children should be physically healthy, mentally alert, emotionally secure, socially competent and ready to learn”. Thus, recognised early childhood programmes encompass a holistic approach to early childhood education. Holistic ECE programmes look at the whole child. They promote cognitive, gross, and fine motor development; they cover health, nutrition, and development; and they incorporate whole human relationships, with families and parents becoming part of the learning of the child (UNICEF, 2006).

Providing holistic ECE programmes in Early Childhood Education centres in the Solomon Islands can have long lasting benefits to the children and to the country as a whole. For example, the health and nutrition aspects of the programme offer many benefits to the children as well as their parents in the long term. At a young age, children can be encouraged to practice a healthy lifestyle. The need for this is evident from personal observation. For example, while Early Childhood Education centres in the Solomon Islands advocate healthy eating habits –the promotion of adopting a healthy lifestyle with healthy foods are often on display on charts on the kindergarten walls – practices are often the opposite, with children bringing junk food such as biscuits and buns (personal observation). Many parents in Solomon Islands have had little or no formal education and, thus, may not have good knowledge about good nutrition for their children. Parents, however, are influential and are the children's first teacher. Thus, involving parents in ECE and introducing them to healthy food and lifestyles can be important for their children.

To take another aspect of holistic education, Solomon Islands is a country of diverse indigenous cultures and languages. Incorporating the teaching of good social skills in ECE programmes enhances a positive social upbringing to our children, and increases the likelihood that they will grow up to value and respect others which, in turn, contributes to building a better society.

The 2009 National Census report puts the number children within the 3-5 year age group at about 46,000, which is about 10% of the total population (≈520,000). According to the Solomon Islands Education Management Information System data

(MEHRD, 2014), 21,700 children within this age range may be enrolled in some kind of centre-based ECE programme. This represents less than 50% of children in this age group. What is happening in terms of early learning to the more than 50% who are not attending ECE is unknown. A high proportion of this group is based in the rural areas (Solomon Islands Gov't, 2009).

Despite this situation, it is clear that interest and passion in early childhood education in the country has been gaining momentum. For example, after the launching of the ECE policy (MEHRD, 2008) and the associated commitment of the government to support this sector, there was a surge in the emergence of ECE centres as well as interest in ECE teaching. The ECE division in the MEHRD since 2008 has been inundated with request for ECE centres to be registered (Ball, 2015). It is the requirement under the ECE policy that for an ECE centre to receive financial support from the government, it has to be assessed and approved by the MEHRD. In addition, commitment by the government through the MEHRD to support the ECE sector through ECE teacher training has been overwhelming. Since 1998 and leading up to the launching of the ECE policy, the MEHRD has supported teacher training of ECE at the Solomon Island College of Higher Education now Solomon Islands National University, through bursaries. Under the MEHRD support arrangement for ECE in the country, ECE teachers receive a salary from the government and ECE centres receive funding of \$100 per child and a \$500 administration grant (Minford, 2014).

Challenges and issues with ECE in Solomon Islands

Discussions about early childhood programmes are often centred on affordability, teachers' salaries, and working conditions. Clearly, these are important issues, particularly for MEHRD as the major funder of the sector, and must be considered carefully if this sector is to be sustained on the long term. Furthermore, affordability is also a constant problem for parents. As well as the rural ECE centres where parents pay some amount of money by way of contribution, many of the centres within urban areas are operated privately and charge fees that may be construed as excessive.

While on one hand, criticisms have been levelled at the “unmapped and unplanned” rapid emergence of ECE centres in the country, one must appreciate the interest and motivations from individuals and communities to be involved in this important sector. Corresponding with the surge in new ECE centres, the need for trained ECE teachers necessitated funding for training of teachers at the School of Education, Solomon Islands College of Higher Education (now SINU) (MEHRD, 2014). A cohort of about thirty trained teachers every year, who would directly come under the government payroll, has posed significant consequences for future affordability and sustainability.

Therefore, following just over a decade of government financial support for the ECE sector, signs of issues regarding long-term financial support have begun to emerge. It is envisaged that in the long term, financial support to this sector is unsustainable (Ball, 2015; Minford, 2014). This prompted a review to make recommendations to ascertain a way forward without compromising this important sector (Ball, 2015). Prior to this review, however, the MEHRD had placed a moratorium on the establishment of new ECE centres as well as new recruitment of ECE teachers (MEHRD, 2014). As a result of this, since 2014, there has not been any registration of new ECE centres or recruitment of new ECE teachers.

Two components of ECE operations that are seen to have accounted for the bulk of the MEHRD budgetary support are salaries and grants to the ECE centres (MEHRD, 2014). Increasingly, as more ECE centres are registered, more teachers will be required, which inevitably will continue to have impact on the support from the government. While the moratorium on new ECE centres and recruitment of new ECE teachers can be a means to alleviate the situation in the short term, it does not, in any way, lead to positive outcomes for more than 50% of children – particularly those living in the rural areas – who do not have access to any form of early learning resources. Unless a solution to this issue is found, the number of children denied access to early learning is likely to increase.

Sustaining the services

While much of the attention on cost of ECE sector centres on the increasing number of ECE teachers, what is less obvious is the salary arrangements in terms of ECE teacher qualifications. Salaries are equated with teachers' qualifications rather than work they do. For example, ten years ago, ECE teachers were all holders of certificates from the Solomon Island College of Higher Education. But with the upgrade to a Diploma in ECE qualifications, salaries have increased significantly as well; the upgraded qualification results in the country ending up with a pool of teachers whose salary the government cannot sustain.

A possible solution may be to reconsider the current arrangement where every teacher with a certain qualification is paid at the corresponding level, and tying salaries to assigned roles as well as instituting minimum qualification for different position in the centres. For example, with the current arrangement, it is possible that all teachers in a centre are ECE diploma holders. It may be asked if this is necessary. While a clear link exists between a teacher qualification and the level of pedagogical knowledge content (Elliot, 2006), Sammons et al. (2003) maintain that qualifications alone do not guarantee an effective teacher; an effective teacher is one with the ability to create an environment conducive to learning. Elliot (2006) points out that the majority of teachers in early childhood centres in Australia had qualifications from a Vocational Educational Provider, either a certificate or diploma. A typical early childhood centre in Australia will have a mixture of staff with qualifications in ranging from degree to certificate. However, the position and the responsibility one holds is determined by the level of qualifications (Elliot, 2006). Such an arrangement could be replicated in Solomon Islands if the MEHRD developed a qualification framework for the ECE sector. Such a qualification framework could define all qualification requirements necessary for ECE in terms of both teaching and positions of responsibility.

One possible scenario is that to be a supervisor or an assistant supervisor, a teacher would have a minimum qualification of a diploma. All other teaching posts would be tasked to certificate holders. With such arrangements, in each ECE there would be only two teachers paid at diploma level and others would be remunerated at certificate level. Such arrangements could substantially reduce the cost of salaries while allowing new centres to access grants from the government, and at the same time provide opportunities for diploma ECE graduates to assume supervisory or assistant supervisory roles at all centres in the country, particularly in the remote areas.

Further, community involvement, particularly in the rural areas must be encouraged. There is a need to bring awareness to parents and communities about the significance of community involvement in this important sector. Solomon Islands communities have a tendency to work together, which is embedded in their culture. Burton (2011), in a study of community based learning in the Kahua communities in Makira Province, noted a strong bond between communities to ensure the existence and continual functioning of their ECE centres. Such commitment is anchored by a number of factors including ownership, cooperation, cultural significance and its relevance (Burton, 2011).

Devolving certain functions and tasks to other education authorities, as well as private organisations, should also be encouraged. The current practice is that the MEHRD and its subsidiary, the Provincial Education Authorities, are shouldering the tasks of ensuring ECE is functioning in the country. However, tasks could be shared with other education authorities such as the churches and other private organisations. Tasks such as mentoring, training, and upskilling— particularly in the ECE Curriculum/National ECE Framework – could be easily handled by other authorities. For example, experienced ECE teachers in these authorities could be used to conduct mentoring and upskilling in different pedagogical approaches to teachers within their jurisdictions. This could be done at no cost to the government. It is anticipated that one positive outcome of such practice is that it would facilitate ownership and partnership of these important documents (Curriculum/National ECE Framework).

Conclusion

With one of the fastest growing populations in the region (Solomon Island Government, 2009), early years education is a major commitment for the government. Already, more than 50% of 3-5 year old children do not have access to an early learning centre, and this number is estimated to grow sharply over a short period (Ball, 2015). Finding a pathway which allows access for these children is important. While it may be unrealistic to have a 100% access for all the children, it is important to take action to lower the number of children who do not have access to an early learning centre.

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The Impact of Village-based Early Childhood Education in Makira Ulawa Province, Solomon Islands

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Abstract

This paper is a summary of research about early childhood education in Makira Ulawa Province, Solomon Islands between 2005 and 2016. The research was a collaboration between World Vision Solomon Islands, Murdoch University, and an external evaluation consultant. They assessed a range of domains from social and physical to early literacy, numeracy and school attendance. They described enabling factors and sustainable practises resulting from a program in villages in the province of Makira Ulawa, Solomon Islands. The programme was designed to give early childhood care and education to children between three and six years of age. This included teacher education. The research focus was on assessing program impact on literacy, numeracy, and school attendance as compared to a control group. The findings of the studies indicated a statistically and educationally significant impact on the program. It also determined the practices which lead to sustainability, and what to “keep doing” in the Solomon Islands context. These findings are discussed in the context of international literature examining early childhood education in developing countries.

Introduction

“It is widely known...that good quality Early Childhood Care and Education programmes have the potential to make a positive difference to children’s development and learning...The Solomon Islands Government...is therefore committed to the development of a quality early childhood sector” (Solomon Islands Government, 2008).

This paper reports on a synthesis of research about Early Childhood Care and Education (ECCE) interventions in Makira Ulawa Province, Solomon Islands (SI) between 2005 and 2016. It discusses the findings in light of international research into early childhood education in developing countries.

Solomon Islands: A Brief Overview for Education

The Solomon Islands, with a population of around 540,000, is comprised of nearly 1,000 islands with more than 80% of the population living in remote and rural areas. The number of children under 15 years old is around 30% of the population (Solomon Islands National Statistics Office, 2016). This nation is one of the poorest in the Pacific region. Poor literacy outcomes among primary school children, gender disparity in the education system, and low rates of school attendance and completion, are three key symptoms of children lacking quality education. They are symptoms that the Ministry of Education and Human Resources Development (MEHRD) is determined to eradicate, as evidenced by the National Education Action Plan (Solomon Islands Government, 2016).

Statistics show challenges in child health and nutrition with 28% (Walker et al., 2007a) for the under 5-mortality rate, and 33% (Walker et al., 2007b) for the stunted growth rate. A lack of knowledge, lack of medical clinics, and poor hygiene affects children's health and ability to learn. These are noted risk factors for adverse outcomes in developing countries (Walker et al., 2007a, 2007b). This data illustrates a need for ECCE and its accompanying parental awareness programs.

Makira Program for ECCE

Originally titled, "Girl Child Reading and Rescue Project", this ECCE program is intended to include girls in the education system alongside boys. The first phase of the program is focused on improving literacy and primary school attendance, while also including a holistic approach to child development. It was implemented between 2005 and 2008. The second phase, from 2008 to 2011, helped teachers-in-training become qualified.

The program was undertaken in partnership with communities, the Provincial Education Authority and the Provincial Government, as well as the Solomon Islands College of Higher Education (SICHE, now known as SINU) and MEHRD. Health promotion and financial planning were also integrated into the project.

Synthesis of Five Papers Summarizing the Makira ECCE Program

Five studies about the Makira ECCE programs were published in 2009 and 2011, two in 2012, and one in 2016.

The studies are:

1. Donnelly, J. (2009), Girl Child Reading and Rescue Project Phase Two Review.
2. Chinnery, S. & Orr, C. (2011), Education Projects in the Pacific, World Vision Evaluation Report.
3. Kelley, L. (2012), Makira Early Childhood Development Program Review Objective One Report, July.
4. Kelley, L., Lee-Hammond, L., McConney, A. (2012), Makira Early Childhood Development Program Impact Report, November.
5. Libby Lee-Hammond & Andrew McConney (2016), The impact of village based kindergarten on early literacy, numeracy, and school attendance in Solomon Islands, European Early Childhood Education Research Journal.

Makira Program Model

World Vision chose remote, economically vulnerable settings, and partnered with communities and government in this initiative. They set goals around ECCE access, enrolment, and school readiness. They ran workshops in parenting and committee governance, trained teachers, and planned for sustainability. They also supported communities to build classrooms and equip them.

Teachers were initially trained by Makira Education Authority using Field Based Training (FBT) modules. This was an introductory training program and provided an ECCE Introductory Certificate. Later, teachers were trained by Solomon Islands National University (then known as SICHE) in the ECCE Teacher Certificate.

Research Methodology

This paper presents a synthesis of research studies from 2005 – 2016, which used qualitative and quantitative methods to gather data. Monitoring logs, observation schedules, interviews, focus group discussions, and assessment tests were used to assess impact. In understanding enabling factors for successful outcomes, the methodology utilised an appreciative enquiry approach (Greene et al., 1989) to explore people’s perspectives. In another program review, a quasi-experimental approach was used to compare the performance of children from Makira, who had graduated to school, with a control group. Two previously validated instruments were used: SENA - the Schedule of Early Number Assessment (NSW Department of Education, 2008) and the Reading Recovery Observation Survey (Clay, 2005).

Table SP: Student participants in 2012 numeracy & literacy evaluation of World Vision Solomon Islands ECCE program, gender & school grade

Findings

2009 Report

The first phase of the program was implemented from 2005 until 2008, and saw access to ECCE created for 22 more communities.

Table SO: Phase 1 Community Partnership Outputs

2011 Report

In the second phase, from 2008 to 2011, all teachers were certificated through SINU. In primary school attendance, there was a very positive shift. Significantly, in contrast to a national net primary school enrolment rate of 56%, and a Makira net primary school enrolment rate of 49% (Kelley et al., 2012), at least 90% of children graduating from the program were being mainstreamed into primary school. The program had attended to wider family needs with a holistic approach. Family financial planning, healthy diets, general hygiene and nutrition workshops had been delivered to communities.

2012 Report Objective One

There were several factors identified as enablers of positive outcomes in this program. Since they potentially provide guidance for future SIG programming, these are divided into topics and discussed below.

A multi-level and whole program approach

World Vision used a ‘multilevel whole program’ approach. They worked with communities, the provincial government and the national government; connecting the three levels in program delivery. They sought to support the provincial government’s use of standards for teacher training, while advocating for further development of standards at the national level. This multilevel, whole program approach has been identified in research as important for effective NGO work (Kelly, 2003).

Good program management

The program was characterised by good quality program management, according to Roche's (2009) criteria. Inclusive consultation between interested parties carefully considered various perspectives. For example, projects did not proceed until at least 50% of community members were supportive. Despite the logistical challenges around remote sites, monthly contact was maintained, demonstrating a strong commitment to accountability and partnering with communities. Respect for community people and their existing strengths were very important. Community skills were drawn into project activities. For example, the success of using local teachers reinforced the approach of building from existing potential in the community. World Vision was able to demonstrate the value of the field based training (FBT) program. This influenced government thinking.

“All along we have criteria that you can go to college (SINU) if you reached Form 5 or 6 but we proved this wrong... those who reached Form 3 can also achieve. We cannot drop someone (from teacher training) just because they went to Form 3 only. There is still potential in these people. The program exposes this – that criteria we (previously) set lied to us.” (Makira Education Authority representative)

The model demonstrated the effectiveness of a low-cost approach when classrooms and teaching materials were constructed out of local materials by community members.

Future program sustainability

World Vision staff felt challenged by community members who expected the NGO would provide resources; in particular, school buildings. They identified this as an over-dependency upon outsiders. Many community members raised the issue of long-term sustainability, and wanted the government to fund ECCE teachers' salaries and provide operational grants. This culture of dependency was not addressed. However, the experience of this program suggests people's attitudes can change. Despite salaries and grants not coming, the program sustained interest and commitment from communities. Their deep commitment was displayed in 2016 data showing the continuation of kindergartens.

2012 Report Objective Two

The specific contribution made to literature in this study was the significant results of targeted literacy and numeracy assessments. The tables below provide summaries of assessment results.

Table L: Literacy results

All five mean differences in literacy were statistically significant at the 5% level, and were in favour of Makira students over their Central Province counterparts. Specifically, Makira students outperformed Central Province peers on average by 11 points in letter identification, by 8 points in word reading, by 6 points in writing vocabulary and by 70 points in reading accuracy.

Table N1: Numeracy Results

Table N2: Numeracy Results

All five mean differences in numeracy performance were statistically significant at the 5% level, and all were in favour of Makira students.

Table SA: School Attendance Results

Differences in school attendance between the two provinces were also statistically significant at the 5% level, in favour of Makira students.

2016 Article

In March 2016, the European Early Childhood Education Research Journal published *The impact of village-based kindergarten on early literacy, numeracy, and school attendance in Solomon Islands* by Libby Lee-Hammond and Andrew McConney. These authors had co-written the 2012 objective #2 report. The article summarised the earlier findings within the context of wider research into ECCE in developing nations, such as considering the importance of quality in ECCE, underscored as a fundamental component in several OECD reports (Neuman & Benett, 2001). They noted a significant component of the quality in this program was the teacher training, with two certificated teachers for each kindergarten.

2016 Data Collection

Data was collected through interviews between April-June 2016; the 29 ECCE centres established with World Vision support during the 2005 – 2011 program, which were surveyed with criteria based on their continuation and upon any external government support. The results showed an exciting continuity and sustainability of the centres and programs, despite no SIG fiscal support. Results showed that 28 out of the 29 ECCE centres were still functioning with weekly classes, even though it had been five years since World Vision withdrew. In that time, centres reported hoping for registration, which would bring grants and teacher's salaries, but they did not obtain it. Therefore, communities have been the ones to sustain ECCE centres.

Table CS: Continuity & Sustainability in Makira Kindys 2016

Discussion

This synthesis of studies makes an important contribution to understanding the early years' education programs in Solomon Islands and, more broadly, in developing countries. Some authors identify an urgent need to find which ECCE interventions are most likely to offset disadvantages in the developing world (Martinez et al., 2011). This paper has described some enabling factors found in effective ECCE interventions.

Poverty is a risk factor for children in developing countries where growth and development may be compromised, causing stunting or death. A lack of knowledge, lack of medical clinics, and poor hygiene affects child health and children's ability to learn.

International research shows that investment in high quality ECCE programs can lift children up to reach their potential (Engle et al., 2011). ECCE programs are a

promising way to prevent development delays. Studies in South America, India and Africa have revealed the positive impact of ECCE on children's development (Hazarika & Viren, 2013; Berlinski et al., 2008; Martinez et al., 2012). Lee-Hammond and McConney's 2016 article contributed to international findings by bringing Pacific-based findings, from Solomon Islands, into the international arena.

High quality ECCE systematically improves children's subsequent learning (Martinez, et al., 2012) and school attendance, (Berlinski et al., 2008) say several authors. The importance of quality is underscored as a fundamental component in ECCE in OECD reports (Neuman & Bennett, 2001). The Makira research investigated educational quality, which was one of the goals throughout the project. This paper reports that program quality appears to have been a fundamental reason for the impact of the Makira ECCE centres. A significant component of the quality was the teacher training. Quality teachers provide quality ECCE. A successful partnership with SINU saw two certificated teachers for each kindergarten. This is "GOLD standard" for ECCE provision and meets international standards.

Another contribution of the reports was targeted literacy and numeracy assessments, which provided rich data for analysis, showing significant gains in numeracy, literacy and school readiness at the 5% level. This program resulted in improvements along a number of child development outcomes, and a comparative study of the effectiveness of a range of specific interventions in SI, which proved to be very worthwhile. This study, however, did not have the time or resources to conduct an in-depth analysis of these elements.

In the last decade, nationwide SI communities have started ECCE centres with a dramatic momentum. Between 2010 and 2014, a four-fold increase in government spending occurred in the sector as a result of newly registered centres and teachers. The community-led increase was so rapid and extensive that SIG sought to slow it down. They needed to halt further government fiscal support of ECCE centres because of significant concerns about the cost implications of expanding ECCE, while the current policy document was in place (Hellyer, 2013). The policy does not provide for cost effective delivery of services.

The systematic approach applied so far by SIG has assisted the development of an ECCE policy, curriculum framework and teacher training. The next steps in that approach around registration, grants, salaries and quality standards are currently being reviewed and redefined by an ECCE Taskforce inside the MEHRD.

Parents truly have grasped awareness messages and moved; gathering momentum as they travel. They have grasped that education will improve the lives of their children and transform their societies (Glasgow, 2014), and ECCE will capitalise on the crucial zero to three-year-old window of human development. Therefore, access issues for ECCE are gradually being met by community initiatives. A systematic approach needs to accompany access.

Enabling factors instructive

The key enabling factors described above could be considered by MEHRD for future programming in Solomon Islands. The project's success provides some signposts to navigate the future. What are the ongoing successes?

Communities have continued to believe in the need for ECCE and encouraged teachers to continue their important work. During World Vision community visits in 2016, parents were asked about what percentages of their children now go to primary school. Everyone replied that "all the children go to school". This is an interesting and wonderful finding that deserves further investigative research, and seems to have grown out of the provision of ECCE.

Within these reflections there is room for celebration. SIG can take the components that have been effective, and further develop systematic approaches. In doing so, they should take note of important lessons learned in the Rethinking Pacific Education Initiative (Taufe'ulungaki, 2014). These are lessons about why formal education systems have previously failed Pacific nations and reveal key issues that, if attended to, will contribute greatly to more successes.

The time is right for more conversations about Pacific ECCE issues. The islands' geography, diverse languages and diverse cultures are unique to the Oceanic region. The Pacific can draw from the evidence and lessons in other developing nations. However, they must chart their own journey thoughtfully and quickly before another *vaka* (canoe) of children miss the early educational opportunities as they paddle toward adulthood.

Recommendations

Expanding SI ECCE has been shown to bring positive development for children. For SI some key issues are confronting the ECCE sub-sector. Explosive growth has occurred as communities have grasped the potential benefits for children. Between 2010 and 2014, when SI had four-fold growth of government spending on registered ECCE centres,¹ the higher number of unregistered centres was not counted. There are many questions whose answers will determine what educational leaders should implement.

This writer offers these recommendations that seem aligned with the research.

- a) Keep encouraging ECCE centres to develop in villages. Champion those who build their own centres ensuring access for their own children (through government and media attention and small financial grants).
- b) Support organisations that train community governance committees and provide them with contestable funding opportunities to help villages.
- c) Carefully train SIG Flexi-Inspectors in several aspects of ECCE support. Conduct visits to teachers and committees with planned community meetings. Utilise technology-like video and portable projectors to ensure consistency in delivering important messages to communities.

1. ¹ MEHRD statistics, shared at partner's meetings.

- d) Promote holistic school readiness by primary schools reaching out and down with meetings, visits, resources and assessment tools.
- e) Partner more with churches and NGOs to be cost effective, reach remote areas and map the nation's ECCE services.
- f) Address teacher quality through pre-service and in-service training.
- g) Supply copies of the National Curriculum Framework to all ECCE centres. Make simple curriculum resources, like lesson plans for three and four year olds, available to all at a subsidised rate.
- h) Encourage communities in practical workshops to: identify the knowledge they own, pass on those cultural and scientific understandings to children. Therefore, including the socio-cultural contexts of community lives in education and empowering them with dignity.
- i) Do more research. For example, a comparative study of the effectiveness of a range of specific interventions with children in SI. This would provide worthwhile information about program content for effective education in SI.

Conclusion

As the small children of Solomon Islands wait on their leaders and educators for guidance about their young lives, we notice things about them. Most are remote and travel long distances to access primary school. Their parents are often illiterate, poor in money and possessions, but they all have hopes for the future. Their parents have come to believe in ECCE. They have always educated their children by oral tradition, but they are hungry for broader knowledge through literacy, that will change the future for their children. They struggle and they wait. In this nation of hundreds of islands, and in this Pacific region of thousands of islands, let us partner together to paddle well and paddle strong for the future of our precious children.

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Informal Conversations of Students at a Pacific Islands University: A study of the nature of shared information and knowledge construction

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Abstract

This study investigated the topic and information in informal conversations by 332 students at a Pacific Islands university, utilizing the College Student Experiences Questionnaire (CSEQ). A quantitative study, it used descriptive statistics and the Kruskal-Wallis test to analyse data. Conceptualized around the notion of grapevines, it found that students are least likely to have conversations on the arts, but are more likely to have conversations on the economy. It was also found that the students were least likely to persuade their peers as a consequence of knowledge they have gained, but are likely to refer to knowledge they have gained to investigate other ways of thinking about a topic. This has implications for the understanding of the co-construction of knowledge by university students outside of class, and what influence that could have on the understanding of intellectual conversations of students within the class. It is important to recognize that the “community of truth” should not be seen as existing only in the classroom, but out-of-class as well where students can have a better understanding of the curriculum, evaluate what is happening in society, and also have the opportunity to disagree and interrogate what is being taught to them.

Keywords: Informal conversations, grapevine, CSEQ, Pacific Islands

Introduction

Student conversations give insights into their intellectual life. While at university, students have the opportunity to examine their views on fundamental questions in life based on knowledge they accumulate through the formal and informal curriculum and socialization through society. In fact, education should enable students to develop a fundamental philosophy based on their culture, history and society. Students should be able to understand society and how they relate to it. Universities should diminish chances of intellectual erosion that can lead to a culture of being stagnant, divisive and anti-intellectual. Conversation is an open-ended, yet dynamic interplay which inevitably produces a new thing through the interaction of the conversationalists. Conversations on beliefs and practices have the potential to inform and transform conversations in other diverse settings. Conversations are often initiated and orchestrated by someone who gets into shared exploration. Conversations that students engage in could involve day-to-day concerns, revolve around compliments and validating one another, engage in dense intellectual exchanges on the curriculum, theory, practice and philosophy, or foster genuine inquiry and experimentation (Mills, 2001). This study sought to investigate the topic of conversations by university students at a Pacific Islands university and the information found in these informal conversations.

Method

This study implemented the CSEQ on 332 university students at a Pacific Islands university. The CSEQ was developed in 1979 by Robert Pace of the University of California, Los Angeles. Since then, more than 500 institutions have utilized this tool to assess the quality of effort students put into using the resources and opportunities made available for learning and development. This study specifically looked at the topics of conversation and the information in conversations as areas of quality engagement. Topics of conversation cover the complexity and depth of the topics of students' conversations. Information in conversations focuses on how knowledge is synthesized and incorporated into students' informal conversations (Inman, 2012).

Conceptual framework

This study is conceptualized around the notion of grapevines, which Brown and Isaacs (1997, p. 1) defined as "informal networks of learning conversations". Informal and thoughtful conversations are processes in institutions. It is important to view informal conversations as essential intellectual capital. Brown and Isaacs argued further that grapevines have the potential to powerfully impact on individuals, especially when it gets someone to see a problem in a radically different way. Grapevine conversations can generate new insights or create a committed action on an area of practice. This contradicts basic tenets in which many institutions are run. There is a common belief that information channelled through the formal space is of significance. However, knowledge creation is a social process and people learn together in informal *conversation* as they work and practice together. Thus, a lot of innovation and creativity can occur on the grapevine in informal conversations. Conversations, then, should be a core process in an institution if it has to garner its collective intelligence (Brown & Isaacs, 1997).

Grapevines are inevitable parts of any organization. These informal conversations often occur among friends and various functioning groups within an organization. The grapevine has tremendous value if it transmits positive discussions and achievements. The grapevine emerges spontaneously and such informal network supplements the formal network in organizations. Grapevine is most active when there is upheaval or change in the organization. The grapevine carries information that helps organization members make sense of events. In the school setting it becomes an informal peer education channel, where routes of transmission occur between members from information they bring from classes, seminars, programs, projects and events they encounter (Frankham, 1998). Wood (1999) stresses that in higher education, grapevines inevitably exists and should be treated as a source of information. For many students and faculty staff members, the grapevine is a major source of receiving information about the organization and its events both in and out of the classroom (Wood, 1999). Therefore, it is important to investigate informal conversations of students to better understand their intellectual life at university.

Data Analysis

Descriptive analysis

Table 1: Topics of conversation by university students

Topics	Mean	Standard Deviation
Current events in the news.	2.16	.906
Social issues such as peace, justice, human rights, equality, race relations.	2.30	.883
Different lifestyles, customs, and religions.	2.29	.838
The ideas and views of other people such as writers, philosophers, historians.	2.63	.051
The arts (painting, poetry, dance, theatrical productions, movies, etc.).	2.71	.930
Science (theories, experiments, methods, etc.).	2.70	.968
Computers and other technologies.	2.21	.892
Social and ethical issues related to science and technology such as energy, pollution, chemicals, genetics, military use.	2.36	.893
The economy (employment, wealth, poverty, debt, trade, etc.).	2.10	.928
International relations (human rights, free trade, military activities, political differences, etc.).	2.39	.950

Table 1 shows that students are least likely to talk about the arts such as painting, poetry, dance, theatrical productions and movies. They are also least likely to have conversations on science such as theories, experiments, or methods. However, they are more likely to talk about the economy and with regards to employment, wealth, poverty, debt, or trade. Students are also likely to converse about current events in the news.

Table 2: Information in conversations by university students

Information	Mean	Standard Deviation
Referred to knowledge you acquired in your reading or classes.	1.95	.784
Explored different ways of thinking about the topic.	2.08	.717
Referred to something one of your instructors said about the topic.	2.14	.779
Subsequently read something that was related to the topic.	2.14	.794
Changed your opinion as a result of the knowledge or argument presented by others.	2.31	.791
Persuaded others to change their minds as a result of the knowledge or arguments you cited.	2.61	.846

Table 2 shows that students are least likely to attempt persuading others to change their minds as a result of the knowledge or arguments that their peers cited. However, they are more likely to refer to knowledge acquired in their readings or classes and explore different ways of thinking about the topic.

Kruskal-Wallis test

A Kruskal-Wallis test was conducted with Faculty as the independent variable, and Topics of Conversations as the dependent variable. The three faculties differ, χ^2 (d.f. = 2) = 50.70, on the science topics of conversations. FA, *Mdn* = 3, and FB, *Mdn* = 3, were least likely to be involved in science conversations than FS, *Mdn* = 2, $p < .0005$. The three faculties differ, χ^2 (d.f. = 2) = 12.61, student conversations on social and ethical issues related to science and technology such as energy, pollution, chemicals, genetics or military use. FB, *Mdn* = 3, is least likely than the FS, *Mdn* = 2, and FA, *Mdn* = 2, $p < .0005$. In terms of information in conversations, the three faculties differ, χ^2 (d.f. = 2) = 14.00, on the persuading of others to change their minds as a result of the knowledge or arguments they cited. FB, *Mdn* = 3, and FS, *Mdn* = 3, are least likely to persuade others to change their minds as a result of knowledge and arguments they cited than FA, *Mdn* = 2, $p < .0005$. There were no significant changes on all other measures.

Discussions

This study aimed to investigate the topic and information in informal conversations among university students at a Pacific Islands university. It was found that students were least likely to talk about the arts such as painting, poetry, dance, theatrical productions and movies. They were also least likely to have a conversation on science such as theories, experiments, or methods. However, when the three faculties were compared, students of the faculty of science were understandably and significantly likely to have conversations on science-related matters. On the other hand, students were more likely to talk about the economy and with regards to employment, wealth, poverty, debt, or trade. Students were also likely to converse about current events in the news. Contrary to this study, Burwell (2005) studied students from a college in the US, and found that they were least likely to talk about current events in the news. Both studies were similar in that they found science to be the least desirable topic among students' conversations.

Students of this study were concerned about what is currently happening to the Pacific Islands, the world, and matters regarding the economy. As Mills (2001) states, students' reactions to informal conversations are more likely to be influenced by perceptions of their pragmatic implications. Mills' statement is applicable to this study in that university students had conversations on matters that practically affect them, such as: the economy, employment, wealth, poverty, and the way current events could influence their future. Scott (2012) reinforces that conversations can be used to elicit emergent and unanticipated aspects of students' thinking within and outside the planned curricula. Conversations play a role in getting students to justify ideas, make judgments, and support their reasoning for a decision they made. Scott further stresses the theory that students' conversations outside of the class have the potential to provide understanding of the intellectual resources they bring into the classroom.

The study also found that university students are least likely to attempt persuading others to change their minds as a result of the knowledge or arguments they cited. When faculties are compared, students of the faculty of art are more likely to attempt persuading others as a result of gained knowledge and arguments cited. Overall, students were more likely to refer to knowledge acquired in their readings or classes

and explore different ways of thinking about the topic. Findings from this study were similar to that of Burwell's (2005), where it was conducted in the US. Students seem to utilize knowledge they gained from their studies, but were least likely to attempt persuading others to change their minds possibly because they see incorporation of ideas as something that is within the realm of the individual. Altermatt and Broady (2009) adds that positive peer conversations between friends are important for students' ability to adapt to situations and build achievement-related beliefs at school. Students who receive frequent positive conversational help from peers reported fewer maladaptive responses to situations and failures that they may encounter at school and in society. Students utilize social comparison information to evaluate themselves, and to guide their behaviours, which allows willingness to share their weaknesses and failures to peers in the hopes of receiving help. Features of students' conversations with friends contribute to achievement-related behaviour and belief (Altermatt & Broady, 2009). Shumack (2007) argues that conversations do not only occur with peers and others, but there involves constructive and reflective conversations with oneself. This is important to enhancing students' creativity, and in taking transformative approaches to activities at hand. Shumack calls this 'internal conversation' as it provides a subjective space where one can negotiate and frame one's utterances in engaging with others and materials.

Therefore, it is incorrect to think that the process of learning primarily occurs in the classroom. Tai-Seale and Thompson (2000, p. 16) advise that formal classes can also delegate "assigned conversations" for students outside of the classroom to foster interaction and cooperative learning out-of-class. It is important to encourage free-ranging, spontaneous conversations on topics with peers. Conversations and discussions in the classroom are not enough. Being able to make productive conversations out-of-class is critical to success of students reaching their full potential. The "community of truth" should not be seen as existing only in the classroom, but out-of-class as well. There, students can have a better understanding of the curriculum, evaluate what is happening in society, and also have the opportunity to disagree and interrogate what is being taught to them (Thai-Seale & Thompson, 2000).

The grapevine, an informal communication network, is an inevitable part of all institutions. It is contended that about 70% of an organization's communication is through grapevines (Crampton, Hodge, & Mishra, 1998). Grapevines are active when the issues in the conversation are perceived as important, and individuals feel unthreatened and secure to contribute. Informal grapevines transmit messages faster than formal ones. The grapevine fulfils a social function, and can help create work groups and the desired opportunities for social contact. Grapevine networks can be effective in generating creative solutions (Crampton, Hodge, & Mishra, 1998). Managing informal and unofficial communication network, known as the 'grapevine', can stir productivity. Information through the grapevine is usually accurate, but can also often contain inaccuracies. A benefit of the grapevine is that it can help individuals receive answers to unanswered questions that they may have. It is important to recognize that grapevine conversations are a permanent part of institutions that should be taken advantage of (Wells & Spinks, 1994).

Conclusion

Outside the classroom are informal or alternate spaces for learning. Analyzing informal conversations enables situating interpretations in the broader understanding of students' learning and concerns. Students co-construct these informal conversational spaces. Due to increasing turbulence in society, university students possibly are concerned and have conversations on the economy and, in particular, employment issues that may affect their futures. Related to this, they also have interest in current affairs and how these may have an impact on them. University students seem to have conversations on matters that are likely to have pragmatic implications on them. And since informal conversations are often nonjudgmental and collegial, they have the potential to encourage reflective thinking and become transformational for students and their studies. These grapevine conversations among university students can lead to the development of shared perspectives and understanding that could support learning in the classroom. By utilizing content students learned in class to create new thinking around a topic, informal grapevines can foster peer professional growth, and provide an outlet for support in their student life. It is important for university educators to recognize and encourage active conversations both within and outside of the classroom.

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The Pacific Islands Indicators for Inclusive Education: A Solomon Islands Experience

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In 2009, Pacific Islands Ministers of Education approved the Pacific Education Development Framework (PEDF); thereby making special and inclusive education a priority policy issue for the Pacific region. For Solomon Islands, this new policy priority required newer ways of working. It ensures that the MEHRD and other government departments, together with schools, non-government and disability peoples' organizations and communities, collaborate to enhance equality of access for children with disabilities.

Funded by the Australian Government, a set of contextually applicable Pacific Islands Indicators (Pacific-INDIE) was developed to support this new policy agenda. The Pacific-INDIE is an important instrument for supporting an effective Monitoring and Evaluation (M&E) framework, thereby providing a means for measuring disability-inclusive education within national settings. Solomon Islands is one of four Pacific countries involved in the trialling of the draft Pacific-INDIE, beginning with a launch in February 2016.

In this paper, we share insights from our experiences as school-based participants in the trialling of the Pacific-INDIE at our school. In particular, we focus on both the challenges and opportunities of the Pacific-INDIE. We ask: What are the challenges for using Pacific-INDIE in a Solomon Islands school? What are the opportunities for using Pacific-INDIE in a Solomon Islands school? What insights can we share as practitioners who have trialled the Pacific-INDIE at our school?

Participants of our session are likely to benefit from the insights we share based on our experiences of trialling the Pacific-INDIE to create a disability-inclusive environment in our school. More so, attendees will benefit from discussions on the wider implications of special and inclusive education regarding "Education for What?" where special needs students are concerned.

Keywords: special and inclusive education, dis-ability inclusive environment

The concept of inclusive education has been promoted globally for more than two decades since the Salamanca Statement was endorsed in 1994. However, the participation of children with disability in education has been very slow to achieve due to many barriers (Sharma 2012). Sharma et al. highlighted the following as some of the barriers faced by many island nations in the implementation of inclusive education in the Pacific Islands, which include: lack of information on inclusive education, inherent discriminatory attitudes, and the continuing disregard for the rights of children with disabilities to attend regular schools. The level of researched information on inclusive education in the Pacific Islands varies from country to country. This has greatly influenced the slow pace in the advocacy and implementation of inclusive educational practices within a very segregated education system inherited from the former colonial rulers.

The signing of the Pacific Regional Strategy on Disability, which highlighted that less than 10% of children with disability have access to any form of education in the nations (Pacific Islands Forum Secretariat, 2009), was a positive step in implementing inclusive practices. The approval of the Pacific Education Development Framework (PEDF) in 2009 by 14 Pacific Islands Education Ministers was yet another step towards including the excluded. The framework highlighted special and inclusive education as priority for all Pacific Island countries, thereby endorsing a rights-based and inclusive approach to disability and education (PEDF, 2009). The 14-member countries of the Pacific Island Forum have adopted this framework, and agreed to work towards disability-inclusive education (Pacific Disability Forum and Pacific Islands Forum Secretariat, 2012). However, the Pacific Island states needed a home grown tool for monitoring and assessing quality, effectiveness, and efficiency, as well as to map progress against relevant indicators developed for their unique environments for measuring inclusive education. According to Sharma et al. 2015, the tool must identify and overcome barriers to bring about quality education in the general education system. It must be robust enough to accommodate the individual's requirements, as well as provide support measures to facilitate access to and participation in effective quality education (Sharma, Forlin, Sprunt, Deppeler, & Jitoko, 2014).

The Pacific Islands Forum Secretariat (PIFS and the Pacific Disability Forum (PDF)) in partnership with Monash University and the CBM-Nossal Institute Partnership for Disability Inclusive Development (The University of Melbourne), took up the challenge to work together in a research project to develop Pacific-centric indicators to measure efforts towards disability-inclusive education, specifically in the member countries (Forlin et al., 2015; Sharma et al., 2016). Three key principles were adopted to guide the development of these indicators to ensure that indicators are relevant to the Pacific Islands. The first principle is “collaboration”. From the outset, a collaborative and rigorous approach to developing indicators, which measure what Pacific Islanders value as authentic and relevant disability-inclusive education, was adopted. The second principle is “a need for systemic change”. This principle articulated that successful implementation of inclusive education will require systems to change in order to meet the needs of an individual child, rather than asking the child to change to fit into to the system (Forlin, 2013). The third principle employed in this project was “nothing about us, without us”. Instead of using the normal top down approach, this project prioritised the involvement of people with disabilities and their families in the research. Those with a disability, along with their organizations, were involved in this research as partner researchers. Ministries of Education, Ministries of Health, Disability Organisations, Teacher Training Institutions and academics from four pilot countries worked from the conceptualization of the project to the launch of the completed document. More detail about the process adopted to develop the indicators is provided elsewhere (Sharma et al., 2016). These culturally relevant indicators in the Pacific-INDIE will assist countries to evaluate their progress towards inclusion, and to develop further plans and targets for providing quality education for children with disabilities. This research is aligned with other Pacific regional processes for improving the measurement of the PEDF. In April 2013, funded under the Australian Government through the Department of Foreign Affairs and Trade's Australian Development Research Awards Scheme, an award titled ‘Developing and Testing Indicators for the Education of Children with Disability in the Pacific’ was started. The Pacific-INDIE aims to measure progress at national, regional, and school and community levels. Education and other government systems and whole communities must work together to ensure equality of access for children with disabilities.

Solomon Islands Context

Solomon Islands consists of six main islands with over 900 smaller islands in Oceania; located to the east of Papua New Guinea and northwest of Vanuatu with a total population of 518,870 (Ministry of Finance and Treasury, 2011). The population is made up of three main races. They are: Melanesians, Polynesians and Micronesians with 80 different languages and many dialects spoken between them.

“People with disabilities and their families are amongst the most marginalized and stigmatized groups in the world. Many myths about people with disability still exist which promote fear and misunderstanding. People with disabilities are often isolated and shunned. Their opportunities for education, work, and appropriate health care and basic human rights are often denied. This leads to poverty both economically and in terms of opportunity” (Ministry of Health and Medical Services 2016).

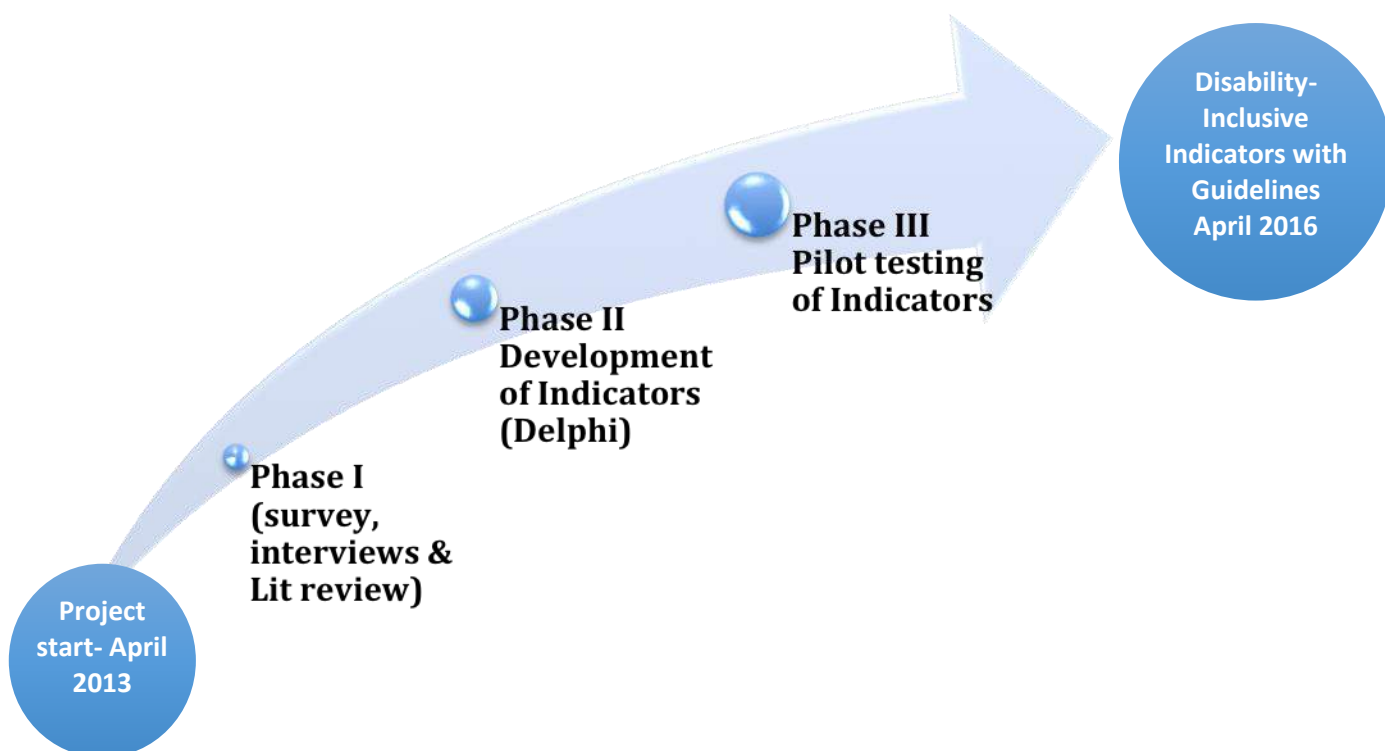
The total population of persons with disabilities in Solomon Islands is 14,403. About 1,881 persons with a disability were under the age of 6-20 (MHMS 2006). According to a (MEHRD Report, 2012), it is estimated that only 2% of all children with disabilities have access to any form of education in the country. Many children with disabilities in the Solomon Islands remain at home, and are looked after by their parents and the extended families (Saemane, Fa’asala & Simi, 2016). This is largely due to Solomon Islands’ cultural context where social attitudes influence the way society perceives and defines disability. Disability is often related to a notion of evil, magical conflict, fear and guilt (Sharma 2012). When a child is born with a disability, the stigma, therefore, stays with them and their families.

In 2014, the SIEMIS data on disability enrolment types indicated that out of a total enrolment 18,579 children, only 2,752 (1.5%) persons with a disability attended school (MERHD 2014). Children with disabilities do not have equal access to education, though many of the children have expressed a desire to go to school. Children with disabilities are enrolled mainly in primary schools with very few making progress to secondary schools (MHMS 2006) (MEHRD, 2013). This is also clearly reflected in the 2014 SIEMIS data on education levels of persons with a disability. The data reports that out of the 2,752 persons with a disability enrolled, 2448 (89%) were enrolled in the Primary, 258 (9%) are in the Junior Secondary, and 46 (0.6%) persons with disability attend the Senior Secondary level (MEHRD 2014). According to Sharma, Simi, Forlin, (2015), those who make it to secondary schools tend only to stay for a few years.

While the Pacific-INDIE Project document has 10 outcomes and 48 indicators and is aligned to the PEDF themes of access, equality and efficiency or effectiveness, the provision for education for children with disabilities is an agenda that the Solomon Islands Government has yet to adequately address within its education system, and which continues to remain a challenge (Sharma, 2012).

Solomon Islands Experience

The project had a clear route, as summarised in the diagram below. Solomon Islands was involved either directly or through PIFS and PDF--two regional voices of the people from the Pacific.



Source: Monash University 2014

Solomon Islands have been involved in this project since its inception through participation in the baseline data collection process. It was involved in the development of the indicators through many collaborative exchanges. Solomon Islands, alongside Vanuatu, Fiji and Samoa, were the four countries chosen to be part of the research team. In-country workshops were held to train DPO's, Solomon Islands' Ministry of Education and HRD, and schools to trial the 48 indicators and 12 core indicators approved by a regional workshop in Fiji. A second workshop was held to qualitatively analyse the data wherein two brochures were produced after the workshop—one in English and the other in Solomon Island Pijin.

The third, and final, workshop was held from the 17th to 18th of February. This was to consolidate how the Pacific-INDIE will be useful for Solomon Islands. On the 19th of February, the first of the four launches of Pacific INDIE was held in the Solomon Islands.

The launch of the Pacific INDIE by the Permanent Secretary of the Ministry of Education and Human Resource Development is a milestone in the implementation of the Disability Inclusive Education in Solomon Islands. The indicators will be very helpful for monitoring and evaluating the implementation of inclusive education in the nation. The indicators were constructed in such a way, that Solomon Islands and the 13 other Countries are obliged to gauge themselves against the 12 core indicators. The Pacific Forum Secretariat had been asked to conduct an annual review on the 12 core indicators, which will be included in Pacific Islands Disability Inclusive Education Frame Work. For Solomon Islands, the other 36 indicators will be added at the right time when the country is ready to include them.

The indicators will help us comply with international disability frameworks, and building codes to accommodate children with disabilities. The indicators will identify the professional training needs of teachers.

Like any new idea, there will be challenges from within the Ministry of Education and Human Resource Development, the general public individuals, and parent. This is due to a lack of information available. One of the challenges faced by Solomon Islands is the very slow phase it has taken to domesticate the international conventions that the nation has already ratified or signed into a domestic law, as required by the Solomon Islands Independent Order 1978. The current Education Act 1978 does not make education compulsory, and therefore, until the new Education Act is enacted by the National Parliament of Solomon Islands, Inclusive Education will remain a challenge. Acceptance of the term “Disability Inclusive Education” as a theme for Educational reform in Solomon Islands will continue to be a challenge amongst academics, disability organizations, and many citizens of Solomon Islands who have waited so long to be included. Solomon Islands has yet to have a specific policy on Inclusive Education. Although a draft has already been sanctioned by the National Education Board of MEHRD, it has yet to be sanctioned by the Solomon Island Government Cabinet for it to become a policy (Saemane, Fasala & Simi 2015). Sharma (2012) proposed that awareness on any policy on Inclusive Education must start within MEHRD to the Education Authorities (EA). Education Authorities are the only legal bodies under the Education Act 1978 to own schools and employ teachers in Solomon Islands. Awareness in MEHRD, Education Authorities, schools, and parents across all of the islands will not be easy.

For Solomon Islands to successfully implement the Disability Inclusive Education in the nation, it must respond to the key findings of the Pacific INDIE project. The Ministry of Education must prioritise outcome, one which purports that children’s right to a disability-inclusive education is supported by legislation and/or policy. Solomon Islands National Inclusive Education Policy must be sanctioned by Cabinet for it to become a legal policy. This will auger well with PEDF (2009) on effectiveness and efficiency and the Pacific INDIE’s outcome one (1). The Solomon Islands Government, through MEHRD, must set up an Awareness Team representing all stake-holders to conduct awareness within MEHRD, EA’s, schools, and parents on the SINIEP.

As Sharma, Simi & Forlin (2015) have observed, with this move towards inclusive education, quality teacher education will become critical to ensure that principals and teachers, both pre-service and in-service, are cognizant of inclusive education and how to support learners in the Solomon Islands with disabilities in their classes. This means that MEHRD must work with the Solomon Islands National University to introduce courses that will upgrade the pedagogical knowledge and skills of both pre-service and in-service teachers.

Pacific INDIE and Solomon Islands Schools

The Pacific-INDIE will certainly be a useful tool for schools in Solomon Islands at the school level. The involvement of three regular schools, namely St. Johns Community High School, Koloale Community High School, and Florence Young Christian School, in the development of the Pacific INDIE, ensures that the document is relevant to be used at the school level. The schools found that the outcomes and indicators are contextualised and, therefore, relevant for use in Solomon Schools from the primary to secondary level. In this regard, the Technical Working Group mandated to consult and write the Solomon Islands National Inclusive Education Policy 2016-2020, which annexed the Pacific-INDIE to the substantive policy. It is hoped that the Solomon Islands Education Management Information System (SIEMIS) will integrate some of the indicators from the Pacific INDIE in the future.

Challenges to Solomon Island Schools

One of the many challenges any school in Solomon Islands will face immediately is in regards to the use of the Pacific INDIE, and how inclusive education will be from the perception of existing teachers and their school leaders. Advocacy for inclusive education in many Solomon Island schools will be a challenge. The reasons are various and include parental fears, lack of resources at schools to cater to the learning of the child with disability, poor school environment, and teachers' negative attitudes because of a lack of knowledge and training (Sharma, Simi, Forlin, 2015).

Another challenge will be the training of teachers in disability inclusive education pedagogies. The buildings in our schools were designed to take in enrol-able students. Therefore, the financial challenge to modify structures in order to comply with the international building codes for disabled people will be a hindrance for the introduction of inclusive education in a regular school. In order for schools to accommodate students with disabilities, appropriate ramps must replace ladders. Lifts for the disabled must be considered in the future to enable students to move higher floors. The use of model technology and assistive device will continue to be a challenge to the school administration, teachers, and the school finances. Special learning resources will also continue to challenge the teachers and school finances.

The way forward For Schools in Solomon Islands

For Florence Young Christian School, and other schools in Solomon Island, the way forward is to consider the benefits of having students with disabilities in the school. This may dispel the fears that have been a hindrance to including the excluded for many years, and to accommodate any initiative on inclusive education by MEHRD. This is clearly articulated by a survey carried out on nine of our most senior teachers in primary and secondary schools, where they expressed their preparedness to offer inclusive education. The research also highlighted how teachers expressed the desire to up skill, especially in the teaching of learners with disabilities (Row, Masikao, Harurihu & Saemane 2016). The sanctioning of the Solomon Islands National Inclusive Education Policy by Cabinet will pave the way for the school to expedite their plans.

Conclusion

The Pacific-INDIE has been developed as a tool to help those in leadership at all levels, including the Pacific Islands Forum Secretariat, Pacific Disability Forum, Ministries of Education in fourteen Pacific Island countries, school leaders, teachers, parents, students, and teacher training institutions like the Solomon Islands National University to monitor and implement their own inclusive education progress.

In light of the Vaka Pasifika Conference's theme of "Education for What? Revisited", the *vaka* has journeyed from Tonga, and has now landed in the Solomon Islands. Over two days of mat weaving, the question must be raised, are persons with disability(s) given an equal opportunity to sit and weave with the rest? Mat weaving in many Pacific countries is an inclusive task, and as Solomon Islands revisits the Question "Education for What", inclusion of learners with disability(s) in mainstream education must be made one of the top priorities of the Solomon Islands education system.

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Solomon Islands Home Economics Teachers' Perceptions of Indigenous Food Preservation Methods in the curriculum

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Abstract

The Education Reform policy of the Solomon Islands emphasises education for life. Relevant knowledge, understanding, skills, and attitudes will enable learners to live in harmony with others and with their environment, and to prepare them for adult life and making a living. The Home Economics Curriculum was designed to incorporate practical knowledge, skills, and attitudes that might prepare them for adult life.

Indigenous Methods of Food Preservation (IKFPM), a component of the current and new Home Economics Curriculum, is not a new phenomenon in Solomon Islands societies. Since the introduction of more commercially processed and preserved food in recent years, however, these indigenous methods have been fast disappearing. Furthermore, in practice, very little has been done by teachers to transmit these worthwhile life skills to the learners.

A key purpose of this study was to gain an understanding of classroom teachers' perceptions of indigenous knowledge of food preservation methods, particularly in the following categories: physical, chemical, and biological food preservation methods in year 9 of the Food and Nutrition component in Home Economics. The data collection method was semi-structured interviews with five classroom teachers selected from five secondary schools in Honiara, Solomon Islands. Collected data were analysed thematically.

By investigating teachers' current perceptions and practices, this study addresses the question "Education for What?" in order to suggest improvements.

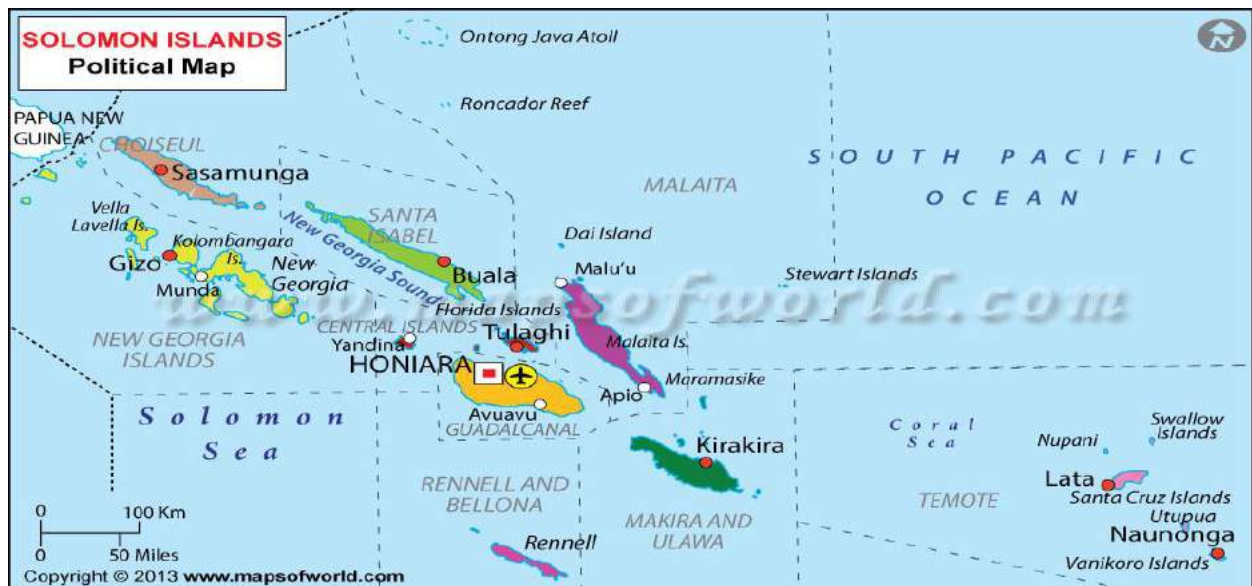
Keywords: Home Economics, food preservation, indigenous Solomon Islands, curriculum.

Introduction

This paper is based on Home Economics teachers' perceptions, values, beliefs, and attitudes towards indigenous methods of food preservation in the Solomon Islands Home Economics curriculum. It was undertaken with teachers from five secondary schools within Honiara, the capital of Solomon Islands.

The population of Solomon Islands, estimated to be about 555,000, is predominantly Melanesian (about 95%) although there are also small Polynesian, Micronesian, Chinese, and European communities. There are 63 distinct languages in the country, with numerous local dialects over nearly 1,000 islands (Department of Foreign Affairs 2016).

Map of Solomon Islands



The study

The study is premised on the belief that teaching indigenous methods of food preservation to younger generations is critical as much of this knowledge is fast disappearing due to the rapid increase in imported processed foods. Little literature exists on this topic; a few articles were sighted on food security from the agriculture department but not specifically on this area.

The research focused on the following four questions: (1) What is the extent of Home Economics teachers' understanding of indigenous food preservation methods in Solomon Islands? (2) Is knowledge of indigenous food preservation methods important for future generations of Solomon Islands? (3) What are the challenges faced by Home Economics teachers in disseminating this component of the curriculum? (4) What are the opinions of the teachers on indigenous methods of food preservation in the Solomon Islands Home Economics curriculum? In June, 2016, interviews were conducted with five Home Economics classroom teachers within Honiara about their perceptions, values, beliefs, and attitudes towards indigenous methods of food preservation in the Solomon Islands Home Economics curriculum. Discussions based on the findings of this research are presented below. To ensure anonymity, participants are given pseudonyms.

The inclusion of indigenous knowledge of food preservation in Solomon Islands Home Economics curriculum is very important as it is the basis for everyday life in a simple Solomon Islands life style. Therefore, it requires teachers to have an understanding of the variety of skills and knowledge of indigenous methods of food preservation from the diverse cultures and ethnicities in the Solomon Islands. According to Warren (1991), indigenous knowledge (IK) is the local knowledge – knowledge that is unique to a given culture or society. IK contrasts with the international knowledge systems generated by universities, research institutions, and private firms. It is the basis for local level decision-making in agriculture, health care, food preparation, education, natural resources management, and a host of other activities in rural communities. International indigenous forum on biodiversity further define IK as, "the essence of the identities and world views of Indigenous peoples. Traditional knowledge constitutes the collective heritage and patrimony of Indigenous

peoples. Therefore, it is priceless to us, and its value cannot be calculated for economic exploitation” (International Indigenous Forum on Biodiversity 2003: Item 7).

Indigenous Methods of Food Preservation (IMFP) are local ways of storing food for later times using simple and natural processes such as drying, smoking, salting, and fermenting. Knowledge and skills used in these processes are passed down through informal education settings in the Solomon Islands. In acquiring knowledge and skills in indigenous methods of food preservation, indigenous ecological knowledge is vitally important. This includes knowledge about planting, harvesting, weather, seasons, and why processes are carried out in certain preferred ways. Some examples follow.

Temotu province: drying nambo

Nambo is the local term for dried starchy foods having a biscuit-like crispness. Traditionally, Islanders dried breadfruit (*Artocarpus altilis*), certain taros (*Alocasia* and *Crytosperma* spp) and *oki* or Tahitian chestnut (*Inocarpus fagiferus*), but today most *nambo* production is limited to breadfruit. Making *nambo* is usually a community effort directed by the women. Extended family groups come together to dry large quantities of breadfruit once or twice a year when the fruit is in season. The fruits are harvested when fully mature, yet still firm, and roasted over an open fire the next day. Fifty to 100 fruits are roasted at a time in large fires until the skin becomes black and hard like charcoal and the flesh softens. This is also the preferred method for preparing breadfruit to eat immediately. When cool, the roasted fruits are peeled with the flat of a knife to flake off the crisp burnt skin. The tender flesh is then cut into small wedge-shaped chunks of about 2 cm x 3 cm. Drying takes place on a variation of the Pacific Island stone or pit oven. A pit of appropriate size, determined by the amount of breadfruit to be dried, is lined with porous coral rock. A wood fire is built in the pit and additional coral rock is placed on the fire to be heated until red hot. For normal baking, volcanic stones are used in the ovens, but the calcium in the coral is thought to enhance the *nambo* flavour. A drying rack to hold the breadfruit chunks is built from woven bamboo splits or from the root of the pandanus palm. More commonly used today is a rack made of wire mesh used for drying chilli peppers or coconut. When the wood has burnt down to coals, the fire no longer smokes, and the rocks are glowing red hot, the rack is put in place about one metre over the oven, either suspended by rope or set on rock or timber supports. The rack holds a 6-8 centimetres deep layer of breadfruit chunks that are stirred periodically to prevent burning. Woven pandanus mats or thatched leaf panels are draped from the drying rack to enclose the fire and prevent heat loss. Heat continues to radiate from the ovens for about 12 hours. As the rocks cool, the rack can be lowered to use the heat more efficiently. Factors determining drying time are: humidity, variety of breadfruit, amount of fruit held in the tray, type of wood burned, and oven size (Brown & Mayer, 1993).

Examples of Indigenous/Traditional Methods of Food Preservation in Solomon Islands



Mature bread fruit for making nambo



Louisa Sakinga mixes curry flavoured nambo on the drying rack (photo Brown & Mayer 1993)



Final product of the bread fruit being dried (nambo)

Some examples of Foods that can be preserved using indigenous methods



Root Crop: Taro



Bread Fruit (*Artocarpus altilis*)



Ngali Nut



Tuna Fish



Mangrove Shell



Clam Shell

Examples of common indigenous/traditional methods in SI

- **Drying** (sun, rack over fire place) reduce amount of water.
- **Smoking** (dried & Smoked Fish)



Drying Bread Fruit Nambo Reef Islands/Santa Cruz

Source: Alice Walani



<https://www.bing.com/images/search?e=smoked+fish&FORM=HDRSC2>

Fermentation

Fermentation is practiced mainly by the Polynesian (Sikaiana) and Micronesian (Kiribati) communities in the Solomon Islands, normally with coconut where toddy is produced.

To make coconut toddy, the end of the stem of the coconut flower is bound with string and cut in a special way (see image). The sap then drips into a bottle or coconut shell and is collected daily (Parkinson et al., 1992).

Here is an example of how toddy is made



Cutting on the Kiribati toddy (<https://www.bing.com/images/search?q=coconut+todd+view>)

Discussion

This section presents the findings and discussion of the teachers' knowledge and perceptions of food preservation methods in the Solomon Islands Home Economics curriculum as follows: (1) teachers' understanding of indigenous methods of food preservation, (2) teachers' perceived importance of teaching indigenous methods of food preservation to future generations, (3) teachers' perceived challenges to teaching indigenous methods of food preservation in the classroom, and (4) teachers' opinions about whether IMFP should be implemented in the Solomon Islands Home Economics Curriculum.

Teachers' understanding of indigenous methods of food preservation in Solomon Islands

Teachers' responses show that their understandings in relation to the first question are varied. Teachers indicated that indigenous food preservation (1) is how local people preserve food in a traditional way for later times; (2) involves drying, smoking, roasting and fermenting; and (3) is diverse and varies according to different islands and ethnicities.

Traditional methods of food preservation for later times

Teachers who held this view refer to indigenous food preservation as native methods used for keeping food for times such as feasts, disasters, or when there is surplus food or a particular food, such as *ngali* nuts, yam, taro, smoked fish, and clam shells, is not in season. For example, said:

When I was a little girl, in my village in the central Islands I observed my grandmother collecting *ngali* nuts from the nut tree. She selected the best ones and roasted them on the *motu* stones, and later put them on the rack over the fireplace in a special woven basket made of coconut fronds. This is preserved for making special traditional pudding during custom feasts. I think this is the local way I am referring to.

Rosa commented;

I saw my mother and aunt harvesting taro in a certain way, in which it was partially cleaned to allow storage for a certain period of time. Later I realised that it has to be transported to another village for a custom feast. The harvesting, handling, storage, and transportation of the taro is very important. You must have the local knowledge and skills in order to do this.

Research undertaken by Benguela (2011) confirms that indigenous knowledge is mainly transmitted orally (i.e. through stories, and/or by imitation and demonstration), while Western science is mainly written.

Local methods of preserving local food

Teachers who held this view refer to IMFP ways of drying local food such *ngali* nuts, bread fruit, clam shell; smoking (fish), roasting (*ngali* nuts), fermenting (cassava and bread fruit), and using locally available materials for preparation and preservation. For example, Monica said:

I think indigenous methods of food preservation is when food is dried in a natural way. For example, by fire in the *motu* (traditional earth oven) or over the fireplace and in the sun and using locally available materials like banana leaves or other bush leaves/coconut fronds for storage rather than using solar or electrical appliances and plastic bags and buckets". Similar sentiments were shared by Rina who commented that, "our indigenous way of food preservation is inexpensive because all the resources are locally available."

Solomon Islands is a culturally diverse society

Teachers acknowledge that because Solomon Islands is culturally diverse, IMFP across the Solomon Islands will vary. They highlighted that uniqueness of Solomon Islands should make us treasure and embrace our identity as Solomon Islanders – Melanesian Polynesian and Micronesian communities. Thus, methods may be similar or may differ. One participant pointed out that:

Solomon Islands is made up of nine provinces and most of our people are Melanesians, thus one method maybe similar in some ways but may vary in other ways. For example, in Makira province a traditional pudding known as the six months pudding is very unique, although preparation may be similar to other parts of the Solomon Islands. The steps and process in preparation may be similar but not exactly the same as compared to the preservation method of the Makira culture.

Rina also viewed IMFP in Solomon Islands as very unique and special, noting:

Solomon Islands is blessed with this diverse culture because it should help our future generation to value, respect, and appreciate the different indigenous methods of food preservation. Today, there are lots of inter-marriages within our country compared to the past generations of our forefathers. Therefore, studying this area in schools should help prepare young people for their future as well.

Solomon Islands is a developing country with diverse cultures and with a very young population (57% aged 24 and younger), hence Secondary Home Economics Teachers' understanding of IMFP is vitally important so they can effectively impart this worthwhile knowledge to the younger generations.

Teachers' perceived importance of teaching IMFP for future generations

Many of the teachers involved in this study perceived that IMFP is very important for Solomon Islands future generations. They all emphasised the importance of passing on the knowledge and skills. For example, Rina said:

Twenty years back our resources were plenty because the population of Solomon Islands was small. Nowadays, resources are becoming scarce, therefore IMFP is very important to save food for later time when you need it. For example, the young generation should know how to preserve root crops that are planted in gardens such as taro and yam or wild yam. When I talk about wild yam, it is not planted but young generations should have the knowledge and skills on how to care for and identify the ones that can be eaten to the ones that are not eatable.

Rosa pointed out that:

Today if you observe most young people, they lack the indigenous knowledge and skills in preparing food. For example, how to light a fire for *motu*, arranging of wood, stones, and identifying the best wood for making the fire, laying of banana leaves on the hot stones, identifying the correct temperature for baking. It requires the know-how, knowledge, and skills; that is, hands on experience. If the future generations do not learn these knowledge and skills at a secondary level, they will depend entirely on introduced processed foods which will become liabilities for this nation rather than assets.

Rosa further noted that IMFP is safe because "food is naturally prepared and has its natural aroma and taste; for example, dried bread fruit (Nambo) and *alite* fruit (coastal almond) from Santa Cruz Islands".

Sarah, however, talked about the importance of IMFP as method of saving money, saying:

If I want to save \$8.00 during the week to buy a tin of *taiyo* (canned tuna), which is \$8.00 x 7 days = \$56.00, I would use a portion of the smoked fish each day when cooking my vegetables and I would save some of that money for other things.

Traditional practices encompass knowledge which is especially valuable in times of crisis or adaptation to changing conditions. Research undertaken by Shepherd (2013) also highlighted that knowledge of wild foods, famine foods, and of food which grows in semi-arid

environments is of enormous importance for the resilience of a community. If the current generation does not acquire such knowledge and skills in IMFP they would not be able to pass it on to the next generations.

When these teachers were asked whether or not they have taught IMFP in their Home Economics Lessons, two teachers out of the five being interviewed said that they teach the theory component in their lessons. The rest of the teachers admitted that they have not taught it at all in their year nine lessons.

Challenges to teaching IMFP in Home Economics classroom

The challenges revealed by these teachers during the interviews were identified as (1) insufficient time allocation for Home Economics lessons, (2) lack of resources/facilities, and (3) Solomon Islands' cultural diversity. The details are briefly discussed next.

Time allocation for Home Economics lessons per week

Most of the teachers involved in this study perceived the time allocated to teach Home Economics lessons of only 2 hours per week as a major challenge to implementing IMFP in their Home Economics classrooms. For example, Rosa noted, "I think two hours a week is not enough since students need to complete given tasks according to the learning outcomes. Sometimes we have to arrange for extra classes to catch up with the content of the curriculum." Similar sentiments were shared by Rina who suggested:

"For classes such year nine I think 4 hours a week should help prepare them since not all of them will continue to make it through to universities. Therefore, teaching of life skills as such at this stage is very important."

Lack of resources and facilities

Another challenge these teachers revealed during the interviews is lack of resources and facilities. They referred to the lack of a proper local kitchen set-up (local materials) to cater for learner's practical sessions as one the greatest challenges to effectively implementing IMFP in their HE Classrooms. For example, Pamela said:

"I think the Home Economics lab should provide proper facilities to cater for both traditional and modern methods of food preparation – for example, motu place (traditional oven), racks for smoking foods, storage, drying, roasting, and fermentation. So that when we talk about drying ngali nuts, we demonstrate to the students the steps and processes and the right temperature of the stones on the local oven. Therefore, improvement of proper facilities is vital."

Solomon Islands' culturally diversity

Another challenge indicated by these teachers with regards to teaching IMFP in HE classroom is the diverse culture of the Solomon Islands. Monica noted, "Since Solomon Islands has a diverse culture, teachers themselves have insufficient knowledge and skills to competently teach IMFP".

Teachers' opinions about whether IMFP should be implemented in the Solomon Islands Home Economics Curriculum

Many of the teachers involved in this study perceived that IMFP is very important not only to students, but also to the various diverse groupings that make up the Solomon Islands. Mary said:

“I believe that IMFP should be taught so that life survival skills and knowledge can be passed on to the future generations. For example, in the Southern part of Malaita, there is a certain method of preserving yam for about two months. This involves knowledge and skills in planting, harvesting, cleaning, transportation, handling, and storage. If young people from this part of the Solomon Islands do not learn these, they may not be able to preserve food for later times, disasters, and for replanting for the future.”

Anna suggested:

“Research should be done on each of the different IMFP methods in the Solomon Islands, so that we learn how other Island groups preserve food in the indigenous way. I think it will be very interesting to learn from our Polynesian and Micronesian groups.”

Jane commented that IMFP is the identity and pride of our diverse culture:

“We as indigenous Solomon Islanders must take pride in our uniqueness and the diverse knowledge and skills that we have. For example, people from Shortland Islands in the Western Province mostly eat smoked foods, which is quite different compared to other provinces in the Solomon Islands who normally bake, boil, roast or grill their food.”

Rita noted that IMFP is a way forward in promoting healthy eating habits and healthy citizens of Solomon Islands:

“If this is competently taught in schools, learners should be able to utilise the knowledge and skills later in life and help them make better food choices. For example, the choice between eating a packet of cream biscuit and dried bread fruit (Nambo); cream biscuit is full of added sugar while Nambo has natural sugar.”

Conclusion

The conversation between teacher participants in this study shows that teacher' perceptions on the importance of indigenous methods of food preservation in Solomon Islands Home Economics curriculum varies, and are influenced by how well they understand the concept. A lack of appropriate resources/facilities and teacher competence contributes to the lack of teaching practical IMFP skills to students. This paper suggests that improving teachers' understanding and competence, and provision of adequate resources and time allocation, could facilitate and enhance their effectiveness in teaching the IMFP in the Solomon Islands Home Economics curriculum.

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Secondary Teachers' Perceptions, Beliefs, and Attitudes Towards Assessment for Formative Purposes in Solomon Islands

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Abstract

The purpose of this study is to gain an understanding of secondary teachers' perceptions, beliefs and attitudes towards formative assessment in Solomon Islands, particularly in years 9, 11, and 12. Data collections includes a questionnaire given to classroom teachers selected from secondary schools in Honiara, Solomon Islands.

This study suggests that if classroom teachers are to become successful '*mediators of learning*', they must have a better theoretical understanding of social constructivism and metacognition. Otherwise, assessment will always sit outside of learning, and classroom teachers and learners will always play traditional rather than contemporary roles in the learning and teaching (and assessment) processes.

In response to the question "*Education for what?*" this paper suggests that education should address both the vocational and academic needs of all citizens of Solomon Islands; and that students' capabilities and potentials are identified and supported. This paper is executed to strengthen secondary teacher's current formative assessment practices so assessment designed to promote learning could be prioritized in their classrooms.

Keywords: Assessment, formative assessment, summative assessment, Learning, assessment for learning and Feedback

Introduction

The assessment systems in the Solomon Islands have undergone major reform in recent years. These reforms led to the development of several official documents to guide and inform assessment practices (Solomon Islands Ministry of Education, 2004, 2014). One of these official documents is the "Solomon Islands Policy Statement and Guidelines for Learners' Assessment in Schools" (Solomon Islands Ministry of Education, 2010).

This policy statement suggests that the outcomes of the national curriculum for all sub-sectors of education (including secondary education) must be taught and assessed effectively and thoroughly using both assessments for formative and summative purposes. This is to provide remedial and enriching activities to learners where possible in order to maximize learning in the secondary classroom. However, in practice, assessment for summative purposes dominates or outweighs assessment for formative purposes, particularly in examination classes (i.e. years 6, 9, 11 & 12). If formative assessment is regarded as one of the most critical assessment practice, and a vehicle to improve student learning as reported by research (Black & Wiliam, 1998), is it well understood and valued by teachers in secondary schools in Solomon Islands? In seeking solutions to this question, I thought it would be best to establish an understanding of how current classroom teachers perceive formative assessment since they are primarily responsible for evaluating instruction and student learning. These new policy directions and assessment issues have created a timely opportunity for this research to be undertaken in the Solomon Islands.

The Study

This paper documents the results of a qualitative study undertaken in 2016 with five (5) secondary classroom teachers in Honiara, Solomon Islands. A key purpose of this study was to gain an understanding of secondary classroom teachers' perceptions, attitudes and beliefs of assessment for formative purposes in Solomon Islands. In particular, the questions this research sets out to answer were: (1) what are the teachers' understandings of assessment for formative purposes and how do they link it to their understanding of learning? And (2) what is the perceived value and impact of assessment for formative purposes to secondary school students' learning? Based on these questions, a preliminary investigation was conducted in order to ascertain secondary teachers' existing perceptions of formative assessment.

The process of data collection included initial interviews with five classroom teachers selected from five secondary schools in Honiara, Solomon Islands. The qualitative nature of the inquiry prompted this research to be conducted using a semi-structured interview with each of the five classroom teachers. The research fieldwork was conducted in Honiara, Solomon Islands. The findings of this research are discussed next.

Findings and Discussions

The focus of the discussion held with each teacher participant during the interviews was centred on their perceptions and understanding of the value and impact of assessment for formative purposes in their schools. What follows is the discussion of the teachers' perceived understanding of what constitutes assessment for formative purposes as indicated during the interviews. In this study, 'T' denotes teacher participants. Thus, the five teachers are referred to as T1, T2, T3, T4 and T5 respectively.

The teachers' perceptions of assessment for formative purposes (or formative assessment or assessment for learning)

Most of the participants appear to have a general theoretical understanding of assessment for formative purposes. They perceived formative assessment as '*continuous*' or '*ongoing*' assessment (i.e. unit tests, quizzes, exercises, homework,) throughout the learning process. It is used by these teachers to provide feedback, and to evaluate the effectiveness of their teaching and learning strategies. It is used to narrow the gap between what has been learned, and what still needs to be learned to plan the specific next step required to improve learning and achievements.

There were noticeable gaps, variations and confusions in their articulated understanding of formative assessment (Dixon & William, 2003). While they can theoretically understand the benefit of formative assessment, they still lack comprehensive and profound understanding of formative assessment. This may largely be due to either their limited theoretical understanding of how assessment could and should be integrated into the learning/teaching process, or their limited knowledge of theories of learning and their relationship to theories and methods of assessment (Black and Wiliam, 1998; Carless, 2007; Torrance & Pryor, 1998).

The teachers' perceived understanding of the distinctions and relationship between assessment for formative and summative purposes

On a theoretical level, participants were able to explain the main distinction between formative and summative assessment, and identify some of the key characteristics of formative assessment (Dixon & William, 2003). Their responses show levels of understanding of these terms and the respective theoretical place of each type of assessment within the teaching and learning process. This was congruent to the current literature on the relationship between assessment for formative and summative purposes (ARG, 2002; Black & Wiliam, 1998; Brookhart, 2007/2008; Crooks, 2001; Harlen, 1998; Hill, 2000; Taras, 2008; Ussher, 2001). Only two of these teachers were able to describe how they dealt with the relationship in terms of the practicalities of classroom management.

In contrast, formative assessment delivers the information during the learning process before the summative assessment. Both the teacher and the student use informative assessment results to make decisions about what actions to take to promote further learning. It is an ongoing, dynamic process that involves far more than frequent testing, and measurement of student learning (T2 & T5).

The teachers' perceptions of the value of assessment for formative purposes

The main views indicated by teachers are outlined as; (1) formative assessment provides feedback opportunities that inform teaching and learning, and (2) formative assessment helps to improve instructions and student learning.

Formative assessment provides feedback opportunities that inform teaching and Learning

Teachers who held this view made specific reference to how formative strategies they employed in their classrooms informed them about students' learning (strengths and weaknesses), and the effectiveness of their instructions during the teaching and learning process. For example, two teachers perceived that formative assessment is beneficial to both the teacher and the students (T1 & T2). T4 highlighted that employing formative assessment strategies in his classroom informed him about the effectiveness of his teaching and student learning. This information enabled him to make the necessary instructional adjustments such as re-teaching and using alternative instructions (Boston, 2002). T3 indicated that "*formative assessment supports him to give immediate feedback, work in partnership with students/colleagues and to engage students in peer and self-assessment*".

Researches undertaken by Hattie (1999, 2003) and Hattie and Timperly (2007) further explains the significant role that formative feedback has in supporting learners to identify their own weaknesses, strengths, plan, and how to take responsibility over their own learning during the learning process.

Formative assessment helps to improve instructions and student learning

Teachers who held this view made specific reference to how formative assessment benefitted students in their classrooms. For example, T2 & T3, when talking about the value of AfL "*said that, formative assessment helped students to improve their learning, improve their attitudes toward learning, and enabled them to take responsibility over their own learning*". T1, T2 and T4, on the other hand, pointed out that AfL, if used properly, could help students' metacognitive processes thus enabling them to self-regulate and self-monitor their own progression during the learning processes. Black and Wiliam (1998) pointed out that

assessment for learning used effectively, can be a powerful means to improving student learning and raising standards and students' achievements. Assessment is of no value unless it is designed to be meaningful, and is seen to be an integral part of the teaching and learning process. To realize the true benefits of formative assessment, Chappuis and Chappuis (2007/2008) and Guskey (2007/2008) urged teachers to focus their attention on what the students and teachers do with the assessment results to improve real-time teaching and learning at every turn.

The teachers' perceptions of the impact of assessment for formative purposes

The main views are outlined as: (1) encourages students' involvement in the learning process and (2) having a positive effect on students' attitudes and achievement.

Encourages students' involvement in the learning process

Teachers who saw the impact of AfL as a way to encourage student's involvement in the learning process made specific references related to formative strategies that they employed in their classrooms. T5 on the impact of AfL, "*When I involved my students in group work or activities, they are willing and motivated to participate in the activity*". T2 pointed out that "*Formative assessment plays a vital role in the learning process of students. It motivates students, makes them eager and willing to do their work, enables them to be active and interested in their classroom activities, and helps students to be committed in their work*". T1, however, believed that such assessment practices cannot be done in isolation from proper planning, classroom management, organisation and proper assessment strategies.

T3 and T4, on the other hand, perceived that in order to engage students in the learning process, they needed to provide a communicative, dialogic and an interactive environment (Bell & Cowie, 1999; Clark, 2006). In doing so, these teachers have reported using a variety of formative assessment strategies in their classrooms to collect evidence regarding student achievement. These included: oral questioning, small group teaching, review and revision, individual conferencing, commenting on or marking students' performance, problem-solving, individual or class discussion, group work, worksheets, assignments and teacher-made-test. These assessment strategies enabled students to collaborate freely with their peers, think creatively, discuss and make appropriate decisions about their learning.

Have a positive effect on students' attitudes and self – esteem

Teachers who held this view made references to their observations on students' attitudes in fulfilling assigned tasks in their classrooms. For example, three participants perceived that self-esteem or self-motivation is one of the keys to student's competence and success, and it can be enhanced by building on students' intrinsic interests. It is worth mentioning here that low grades from summative test and extrinsic rewards were not the only factors inhibiting students' low self-esteem as there are other external factors as well.

Teachers in this study appear to hold two opposing views on the type of approaches they used in their classes to enhance student self-esteem. T1, T2 & T4 held the view that students' self-esteem is enhanced by building on students' intrinsic interests, while T3 and T5 held the view that students' self-esteem is enhanced by extrinsic rewards such as praise and encouragement, grades, prizes, and so on. Research undertaken in this area (Assessment Reform Group, 2002; Black and Wiliam, 1998; Clarke et al., 2003), have all suggested that a classroom culture that

promotes formative assessment which focuses on helping students to learn better, feel ownership, and have choice in their learning, can have a positive effect on students' motivation to learn rather than a school culture that focuses on rewards, grades, 'gold stars' or ranking. These studies have reported that low attaining students have low self-esteem and their low self-esteem is reinforced by constant failure, while high attaining students have their high self-esteem reinforced by constant success. Students who believe they can learn, face new challenges in a state of 'relaxed alertness', an optimum state to take risks and learn. On the other hand, low attaining students, who believe they cannot learn, experience stress, when facing a challenge. So, according to Black and Wiliam (1998), they 'retire hurt', and avoid investing effort in learning which could only lead to disappointment – hence no learning taking place.

Congruent with the research undertaken by the Assessment Reform Group (2002), Black & Wiliam (1998), T2, T3 and T5 have also pointed out that formative assessment can enhance student motivation and self-esteem by: providing feedback to move learning forward; providing the scaffolding that students need to genuinely succeed; emphasizing progress and achievement rather than failure; and reinforcing the idea that students have control over, and responsibility for, their own learning.

The teachers' perceptions of the challenges of formative assessment

Many of the teachers in this study do acknowledge the significant effect AfL has on students' attitudes and achievement. However, they perceived that its successful implementation in secondary school classrooms depends on the following inhibiting factors: (1) teachers' understanding and interpretation of the concept of formative assessment. (2) class size, (3) pressures from test/exams and school ethos/policy, and (4) influence from summative assessment.

Teachers understanding and interpretation of the concept of formative assessment

While formative assessment can have a significant impact on students' attitudes and achievement, most of the teachers involved in this study suggested that its implementation in secondary schools depend on teachers' understanding and interpretation of the concept of formative assessment.

Research undertaken by Heritage (2007, p.4) highlighted that "even if teachers have all the required knowledge and skills for formative assessment, without the appropriate attitudes toward the role that formative assessment can play in teaching and learning, their knowledge and skills will lie dormant". She then urged teachers to view formative assessment as a worthwhile process that yields valuable and actionable information about students' learning. And to view formative assessment and the teaching process as inseparable with the recognition that one cannot happen without the other.

Class size

Participants do acknowledge the importance of AfL in involving students in the learning process. However, these teachers perceived that large class size impede formative assessment as a classroom strategy. Researches undertaken by Black & Wiliam, (1998) and Carless (2007) all revealed that large class sizes impede interaction The teacher–student ratio in

secondary schools in the Solomon Islands has increased from one teacher to 35 students (1:35), to one teacher to 40 students (1:40) in recent years in order to address the issue of children's access to school (Solomon Islands Ministry of Education, 2004).

Pressures from tests and external exams

Participants indicated during the interviews that a testing and exam culture can impede the implementation of AfL in the classrooms. They perceived that pressures from internal tests/exams, together with the school-wide external examinations, restricted both their teaching styles and engagement in the learning process of their students. Although tests and exams have their well-established purpose and procedures, in securing public confidence in local schools, these teachers said that their undue influence on the development of effective formative assessment is a significant constraining factor with respect to sound teaching and learning. Aitken (2000) also revealed how both internal and external exams can hamper teaching approaches and the best ways to develop the learning of students.

Influence from summative assessment

Participants indicated that excessive summative assessment can impede effective delivery of formative assessment in secondary schools. Aitken's (2000) pointed out that if the school ethos is exam-oriented, and the political commitment within the school tends towards external assessment, formative assessment can be marginalized. This is accorded to the situation in secondary schools in Solomon Islands as T3 further noted: "in a testing/examination culture, my teachings always restricted only to what is to be tested or examined".

In the Solomon Islands, where classroom assessments serve the primary purpose of accountability, certification, promotion and qualifications, tension is possible between formative assessment and high visible internal and external summative tests, and nationwide examinations which are administered at the end of Standard 6, Form 3 and Form 5 (Ministry of Education, 2004). The examination system does not evaluate or report student progress in achieving learning desired outcomes, and does not promote the adoption of teaching practices that support continued learning through the schooling period.

Conclusion

The conversation with five teachers in this study, regarding their perceptions and understanding of the value of formative assessment in secondary schools in Solomon Islands, have close links to the current principles of formative assessment. The analysis of teachers' perceptions and understanding of what constitutes assessment for formative purposes was based on three common themes emerged from participants' interview transcripts: teachers' perceived understanding, value and impact of assessment for formative purposes. Clearly, there are noticeable gaps and variations between teachers' perceptions and theoretical understanding of formative assessment as well as their capacity to implement the relevant practices in their classrooms. Although they can theoretically understand what constitutes formative assessment processes, they still lack comprehensive and profound understanding of the real importance of formative assessment processes. The findings of this study indicated that formative assessment, as a classroom strategy, does have a place in secondary schools in Solomon Islands. Assessment for Learning (AfL) is currently employed by these teachers,

but the form of formative assessment being used in Solomon Islands secondary school classrooms is limited as reported by policies, systems and methods employed by schools.

This study suggests that if classroom teachers are to become effective ‘*mediators of learning*’ they must have a better theoretical understanding of social constructivism and metacognition. Otherwise, assessment will always sit outside of learning, and classroom teachers and learners will always play traditional rather than contemporary roles in the learning and teaching (and assessment) process.

Finally, for improvements to be made in areas highlighted in this study, focus must be on teacher knowledge and ability and the policies and practices of schools. Unless teachers, students, parents and policymakers value can see the potential of formative assessment, formative assessment will continue to be under-emphasized/valued/used.

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Towards Technology Education in the Solomon Islands: Implications for Curriculum Development and Implementation

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Abstract

Technology education in Solomon Islands is offered in secondary and tertiary schools in the formal sector, and as Technical and Vocational Education Training (TVET) under the informal education sector. Technology Education curriculum for secondary schools in the Solomon Islands is being developed into a more technological literacy approach, comprising of technological knowledge, technological process and technological values. This paper is based on studies done on primary, secondary and pre-service teachers' views on technology and technology education. The methodology used for this inquiry was a qualitative approach within an interpretivist paradigm, which is a deeper understanding of the issues under the investigation that was obtained. The research data gathered from the studies were obtained from interviews, which were then thematically analysed. The findings revealed that the teachers view technology as new artefacts, and technology education as learning that involves hands-on activities. Thus, the teachers' narrow perceptions of technology and technology education will have an implication for technology education curriculum development and implementation. The findings further suggested that a reform that facilitates professional development for teachers to effectively implement technology education in schools is necessary.

Introduction

From time to time, the Ministry of Education and Human Recourse Development (MEHRD) in the Solomon Islands has continued to undertake educational reforms. Consequently, some significant changes have been done to the school curricula over the years. One of the changes includes the development of a new curriculum, which is now known as Technology. These changes were instigated in accordance to the global shift of this particular curriculum from Technical Education to Technology. While education reforms promote changes, it is also important to consider teachers' response to changes as an important dimension to development and implementation of a new curriculum (Sade & Coll, 2003). Claxton and Carr (1991) states that changes enacted without the commitment of teachers may fail to convey the spirit anticipated. Technology education has introduced a new era as proposed for primary, secondary and tertiary education in the Solomon Islands. Therefore, the understanding of teachers' perceptions of technology was important for providing a platform from which to develop and facilitate an appropriate professional development intervention programme. This is to help teachers better implement the proposed technology curriculum as intended for the Solomon Islands. The objective of these studies sought to explore teachers' existing views of technology that would likely to impact how they understand and use the new curriculum.

Methodology

The research data gathered from the studies were obtained from interviews, which were then thematically analysed. This paper is based on three separate case studies. The first case study was done on 30 primary school teachers in the year 2000, while the second case study was on eight secondary technology teachers in 2005 and 2006. The third case study was done on ten secondary technology pre-service teachers in 2015. The data gathered from the interviews

were transcribed and thematically analysed. These three case studies had the same objectives, which sought to gain an understanding of the views teachers held on technology, which would influence their teaching practices in the classroom. The objectives of all three case studies were focused on these two questions;

- (1) What are the teachers' existing views of technology?
- (2) Would the Professional Development (PD) intervention programmes employed enhance the teachers' concepts of technology?

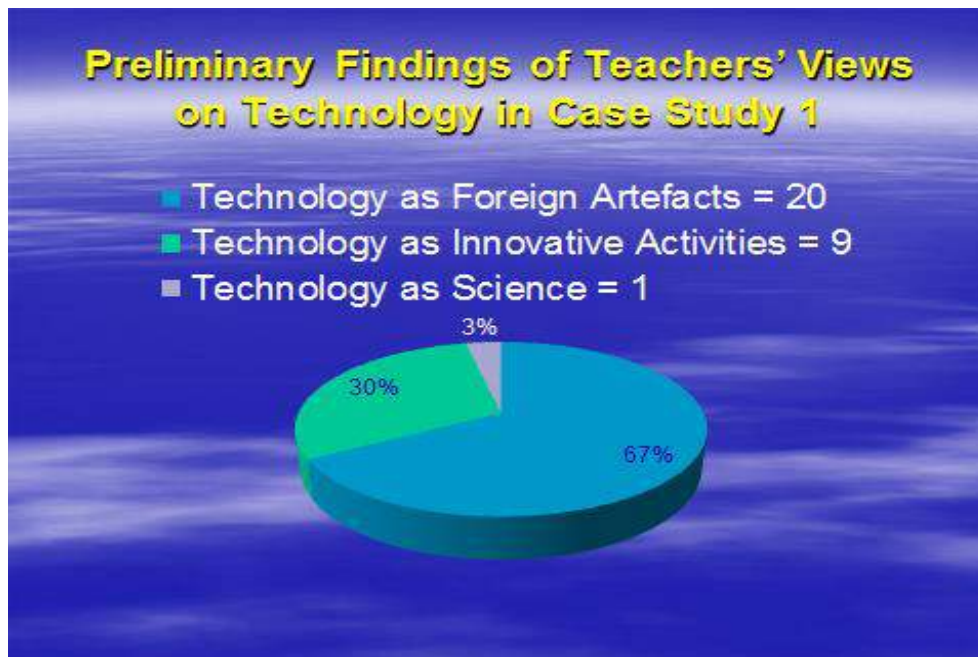
Findings and Discussions

This section discusses the situations prior to and after the professional development intervention programmes in all three case studies, based on research question one; and the impact of the PD interventions on teachers' concepts of technology, based on research question two.

Preliminary Findings

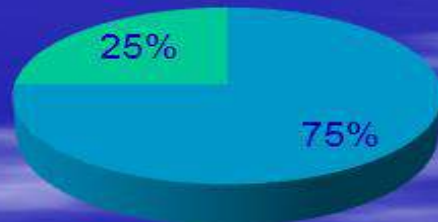
The preliminary findings in all three case studies revealed that the Solomon Island teacher participants involved in these studies had limited understandings of the nature of technology prior to the PD interventions. These findings were similar to findings in other studies about teachers' perceptions of technology in the Solomon Islands (Liligeto, 2001); and also in other countries such as the UK (Jarvis & Rennie, 1996), Australia (Symington, 1987) and New Zealand (Jones & Carr, 1992). Teachers from various countries with limited understanding of the nature of technology and technology education had struggled to come to terms with their respective technology curricula (Anning, 1994; Jarvis & Rennie, 1996; Symington, 1987).

Figure 1



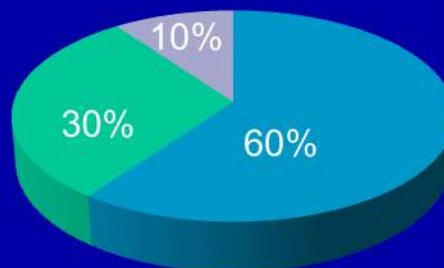
Preliminary findings of Teachers' Views on Technology in Case Study 2

- Technology as Artefacts = 6
- Technology as Application of Knowledge = 2



Preliminary findings of Teachers views in Case Study 3

- Technology as New Artefacts - 6
- Application of New Ideas - 3
- Technology as Science - 1



There are three common themes that emerged from the findings of the preliminary inquiry data. First, technology as an artefact. Second, technology as a process that involves knowledge and creativity, and third, technology as science. The first two themes were evident in all three case studies, while the third theme was only evident in case study 1 and 3, as indicated by the pie graphs in Figure 1.

Technology as Artefacts

These studies revealed that the majority of the teachers' existing views of technology were mainly focussed on artefacts in all three case studies. As shown in figure 1, primary teachers made reference to foreign artefacts; secondary teachers made reference to artefacts which include both foreign and traditional artefacts, and pre-service teachers made reference to new artefacts. The view teachers held of technology as artefacts or physical hardware that was invented or created by human beings, was a common theme revealed in such studies from the work of DeVore (1980), de Vries, (2005), Mitcham (1994), and Wright (1996). This was similar to the findings of previous studies in the Solomon Islands that examined the

secondary school teachers' perceptions of technology and technology education (Liligeto, 2001). The teachers' views of technology as artefacts were mainly dominated by products imported into the country. These may, perhaps, be influenced by the fact that the Solomon Islands is a developing country, and most technological artefacts used in the country such as telephones, computers, and cars are mostly common in the urban areas of the Solomon Islands such as the capital, Honiara (where the study was undertaken). It was also interesting to note, that popular artefacts in the areas of communication and transportation, which were identified in other studies (Jarvis & Rennie, 1996; Symington, 1987), were also identified in these studies as teachers talked about their views of technology. De Vries (2005) states that people's immediate encounter with technology is through technical artefacts. Technology being foreign ideas and products was a common theme. Symington's (1987) discussion about teachers' ideas on technology in the primary school curriculum indicates the use of the term 'technology' by the media tends to link it to more sophisticated and recent industrial developments; such as the use of lasers, computers and robots, and with modern medical techniques. As the Solomon Islands is a developing nation, most of the modern technology used in the country is imported from overseas. Therefore, it seems reasonable that the teachers would perceive such technologies to be foreign in origin (Sade & Coll, 2003). The teachers made specific reference to technology as artefacts which are used elsewhere in the world, but only recently introduced into the Solomon Islands.

Technology as Process

Some teachers viewed technology to be a process that involves application of knowledge and creativity. Secondary school teachers make reference to knowledge applied in making things. This view of technology reflects the notion that technology is a process or an activity undertaken, with a product or an artefact as the outcome. The teachers considered technology to be the application of practical knowledge and skills when using technological tools to perform a technological activity. Thus, technical trades such as carpentry and furniture making, were all regarded as technological activities. Teachers placed a particular emphasis on skilled jobs involving the use of machines and hand tools. By undertaking these technological activities, skills and know-how knowledge were applied. Thus, the completed buildings and finished artefacts were seen as evidence of practical know-how being put into practice. Teachers in the study considered that both knowledge and skills were useful and should always be applied when constructing a product. However, Pacey (1993) states that technological practice is much broader, involving the application of scientific and other knowledge to practical tasks, and the application must be relevant for the students when faced with a real-life situation in society. However, the activities highlighted by teachers seem to be dominated by school-based activities made in reference to school-related activities that teachers were involved in. Such activities include, making furniture, model houses and play environments for younger children. This suggests that the teachers' view of technology as a process or an activity was not only focused on product making, but also limited only to school-based project activities. Black (1994) points out that teachers with technology concepts linked to making things, usually only focused on vocation-oriented purposes when they teach. As these teachers had technical education teaching backgrounds, the influence of the technical subject subculture was very evident in their views. Thus, their focus related to a narrow skills-related know-how type knowledge required for undertaking activities. This view held by the teachers is likely to impact on their teaching and learning of technology education in the Solomon Islands.

Both the primary school teachers and pre-service technology teachers view technology as innovative activities and application of new ideas. The teachers in this study associated modern technologies as new and foreign practices. In contrast, indigenous technologies were associated with old traditional ways of doing things, and a more traditional lifestyle, as is still practised today in most rural areas and even by some people in the urban areas of the Solomon Islands. These teachers made reference to the transition of traditional ways of doing things to modern ways of doing things. For example, teachers talked about the traditional practices in terms of making gardens and constructing buildings in the Solomon Islands which are now being replaced by modern materials and methods. Others talked about the on-going use of the local (natural) materials for constructing of artefacts by past generations in the modern era or a modernised version of similar artefacts made by the present generation. The traditional materials used by past generations referred to those mainly used for building constructions and the use of these same materials today. Therefore, the transition of these traditional materials from past generations through to the present generation has perceived to be the use of indigenous technology in a modern era. This highlights the historical aspects of technology as Rennie (1987) comments that some teachers recognised the historical era of technology, as there exists a history of changing technology. Some teachers made clear, sometimes negative, comparisons between the kind of technology that existed before and more modern technologies. Staudenmair (1989) states that technology determines the way people live and, as a consequence, modern technology changes people's lifestyles and their ways of doing things. These changes are evident as people move from the old systems to the new, for example, in the transportation and communication systems. The existence of modern transportation and communication technology in the Solomon Islands determines people's choices in travelling and communication, and this makes a major contribution to the teachers' perceptions of technology (Sade & Coll, 2003).

Technology as Science

Only two teachers in all case studies held the view of technology as science and their views also forms part of the limited understanding teachers had of technology. Although the teachers in these studies commented that scientific knowledge was also technological knowledge, this view was still vague in terms of the relationship, between scientific knowledge and technological knowledge and tended to focus more on the technical know-how for building construction work. Custer (1995) explains that technological knowledge is the knowledge of accumulated practice, which can become quite specific when transformed into learning technological process. He further explains that technological processes represent arenas of activity generally focused around the performance of technological activities. Thus, the need for the enhancement of teachers' understanding of the nature of technology and technology education in the Solomon Island was justified.

Post intervention Findings

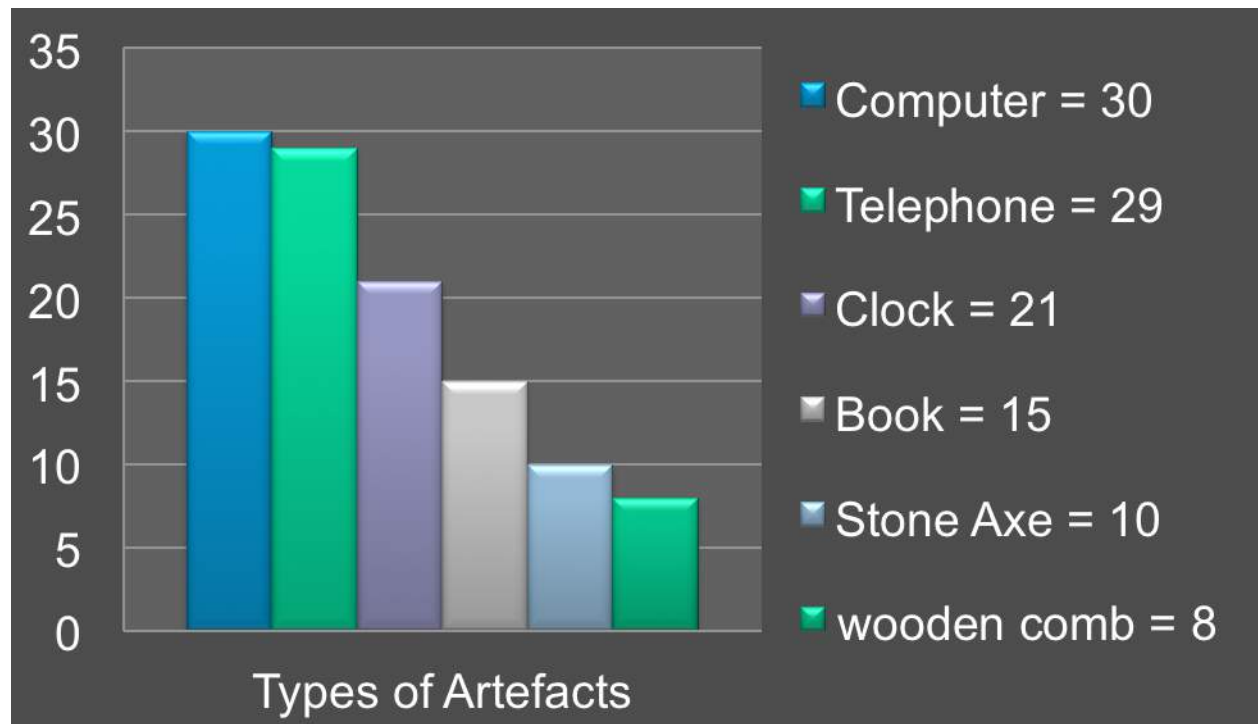
The discussion in this section is based on the findings of the three case studies after the PD intervention programmes.

The Impact of the Intervention on primary School Teachers' Perceptions of Technology

The responses for all of the participants to the picture quiz are shown in Figure 2. The responses to the picture quiz were analysed in terms of pictures chosen to be representative of technology and the number of respondents that chose each individual picture. The data are in

general consistent with the findings of the interviews with a strong emphasis on ICT and related artefacts. For example, the picture quiz data revealed that the computer was chosen by every primary teacher. On the other hand, the stone axe and wooden comb was chosen by only a few teachers.

Figure 2



The findings revealed by the picture quiz intervention imply two contrasting views of technology. Most of the primary teachers perceived traditional technology as a non-existence phenomenon, while a few teachers viewed traditional technology as things and ideas belonging to Solomon Islands. The group that thought of technologies as foreign, which are not of Solomon Islands origin, viewed traditional Solomon Islands technology as a non-existence phenomenon. Liligeto's (2001) study of the Solomon Islands secondary educators' perceptions of traditional technology, indicates that Solomon Island secondary teachers agreed that the Solomon Islands has traditional technologies, and these teachers described these technologies as the Solomon Islands ways of doing things, local artefacts, cultural heritage. These have been passed down through generations from ancestors, and are practices that are useful for living in the Solomon Islands society. These views of traditional technology are similar to the views held by the small group of primary teachers involved in this study, who also perceived traditional Solomon Islands technology to be things and ideas belonging to the Solomon Islands.

The views expressed by the primary teachers on Solomon Islands Traditional technology confirm the views expressed by the educators in Liligeto's (2001) study on traditional Solomon Islands technology. Those primary teachers who did not see cultural heritage as traditional Solomon Islands technology, perceived the cultural heritage as traditional technology only if its features or outlooks have changed from its original. This view implies that the cultural artefact can only be regarded as traditional technology if it undergoes innovation and changes. In addition, the picture quiz used for the intervention in case study 1 did not have some effects on changing teachers' beliefs on technology. Although the findings

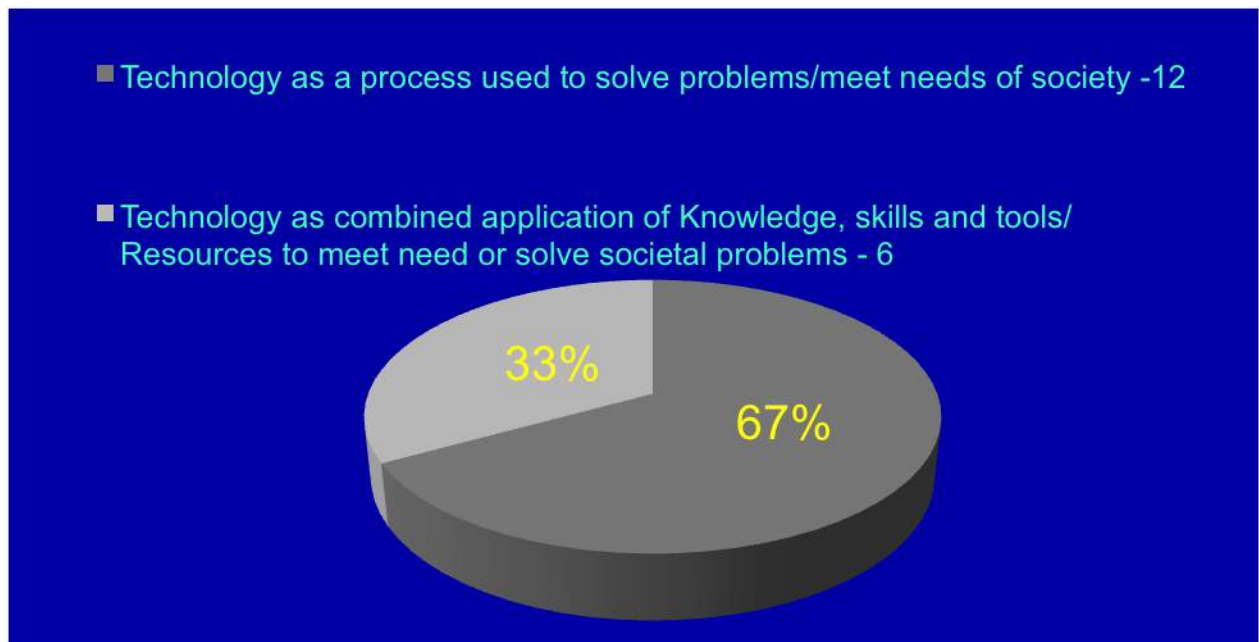
confirmed that majority of the teachers have perceived technology as foreign artefacts, a small group of teachers believe that the Solomon Islands traditional artefacts were also technology. The effect of the picture quiz is that it manages to sway some of the teachers' beliefs on technology to inclusive of the Solomon Islands traditional technology.

The Impact of the Intervention on Secondary School Teachers' and Pre-Service Teachers' Perceptions of Technology

At the end of the teacher professional development intervention programme in case study 2, the teachers' perceptions were investigated again. The following details the findings of the teachers' perceptions of technology, and are discussed under the theme of the teachers' changed perceptions of technology.

The teachers' limited understanding of the nature of technology with artefact-related perspectives had been enhanced to include technology as a process used for solving technological problems to meet the needs of society. This change in viewing technology as a process humans undertook for solving technological problems in society portrays technology as a human activity (Compton & Jones, 2004; de Vries, 2005; Ginner, 2007; Mitcham, 1994; MoE, 1995). The teachers' changed views were very similar to the range of technology definitions shared by scholars such as Burns (1992), Compton and Jones (2004), Cutcliff (1981), Johnson (1989), Lux (1983), Naughton (1992), Pacey (1993) etc. The technology definitions shared by these scholars were discussed in Workshop One in case study 2, and the lecture in case study 3. It is believed that this discussion influenced the changes in teachers' views of technology. Teachers no longer saw technology as just an artefact, but rather as a process for addressing practical problems in society. This is an indication that teachers' understanding of the nature of technology was enhanced as a consequence of the professional development intervention programmes. When teachers talked about technology, in particular, either during the last two workshops in case study 2 or during conversations in the classroom practice sessions in case study 3, they made references to technology as human activities which involved technological problem-solving in society or addressed the needs of society (Compton & Jones, 2004). The consistency of this view of technology was evident in all teachers' comments. Other factors in both case studies 2 and 3, which also contributed to influencing the teachers' views of technology were the video clips with a technological problem-solving focus, and the presentation of local technological problems with proposed technological solutions. The content of the intervention in both case studies 2 and 3 was focused on technology as a problem-solving concept to meet the needs of individuals, communities and societies. Therefore, the teachers also viewed technology as a way to find technological solutions for today's problems. Thus, the impact of the PD intervention programmes on enhancing teachers' understanding of the nature of technology was evident, as shown in Figure 3. The findings presented in Figure 3 represent the views expressed by both the secondary in-service and pre-service teachers with a total of 18 participants.

Figure 3



Compton and Jones (1998), and Jones and Moreland (2004) suggest that an effective way to develop teachers' conceptualisation of technology education and other technological related aspects, is through reflection of theirs and others' concepts of technology and pedagogical knowledge. Teacher reflection and sharing was the key principle underpinning the enhancement of teachers' understanding of the nature of technology in this professional development intervention. This approach encouraged teachers to reflect on their own views and make adjustments in comparison to the views shared by other scholars on technology. The teachers could see similarities and differences between their views, and those held by the scholars on technology. This comparison influenced the teachers to change their views of technology. Consequently, the teachers' changed views tended to reflect the scholars' views of technology. Hence, more teacher reflection and sharing time was specifically requested by teachers as evident in their evaluation forms. This request confirmed teacher reflection and sharing was effective for enhancing and consolidating teachers' conceptualisation of the nature of technology. As Bell (1993) and McGee (1997) stated, unless the teachers themselves recognise the need for change and see it as preferable to their current situation, changes will not occur. The teachers' reflection and sharing of their concepts of technology during the workshops enhanced and consolidated their understanding of the nature of technology.

Conclusions

The findings from these studies reveal that the primary school teachers, secondary school teachers and the pre-service teachers share similar sentiments regarding the views they held on technology. The teachers' perceptions of technology were narrowly focused on the physical elements and skills-related focused learning prior to the PD intervention programmes. The inclusion of the picture of the traditional crafts (i.e. the stone axe and the wooden comb) in case study 1 has convinced some teachers to view traditional artefacts as also being technology. However, the views held by secondary teachers and pre-service teachers, who have undertaken some professional development in a form of workshops and a lecture, have been broadened to include a more rational understanding of technology; in

combination with technological knowledge, skills, tools, resources, along with the nature of technology and its' relationship with society. The forms of professional development intervention programmes, undertaken by these teachers in case study 2 and 3, have contributed significantly in enhancing the teachers' perceptions of technology education. Perceiving technology, in relation to society, has reflected technological literacy (Daker, 2005), which also implies that the teachers now have much broader perceptions of technology.

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An Enhanced and Contextualised Shared Reading Approach (CSRA) to Improve Children's Literacy in the Pacific

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Abstract

Illiteracy rates are a growing concern in the Pacific region, and continue to escalate despite efforts by Ministries to abate it. Successive reading programmes, including the Shared Reading Approach, have been introduced in an effort to reduce the trend but with little success due to lack of finance and access to the expensive resources required. This report discusses how Shared Reading may be blended with phonics and aspects of the Multiple Intelligence Theory in a contextualized approach to addressing poor literacy in the Pacific region.

This paper explains how pre-service teachers may be taught the processes involved, and how they may easily and cheaply develop their own resources. It also illustrates how Multiple Intelligence Theory can inspire the creation of activities that link Shared Reading to enhancing children's comprehension, grammar, and writing skills, as well as improving their ability to read. The inclusion of a phonics programme to help slow learners and non-readers is also outlined. The successes and challenges that teachers may experience using this approach are highlighted by feedback from pre-service and practicing teachers who are trialling this programme in various island nations.

This approach is new so more data is needed to fully evaluate its strengths and weaknesses. However, initial feedback suggests that Pacific children enjoy being taught this way and that, and from the trainee teachers' perspectives, it really works as a teaching and learning strategy.

Introduction

Shared Reading (SR) began in the 1960s with the Book Flood Strategy headed by Sylvia Ashton-Warner in an attempt to raise literacy levels. A later development was the Shared Book Experience, or what is now referred to as Shared Reading—an approach attributed to Don Holdaway (1979), an Auckland teacher and researcher. He discovered that the approach was particularly useful for the Pacific pupils entering the country, and also for Maori who were migrating in numbers from the rural to the urban communities. It was then introduced to developing countries in the 1980s (including Fiji) to address the concern of pupils being required to learn in a non-native language (Elley, Cutting, Mangubhai, & Hugo, 1986), where it proved to be a very successful programme.

In essence, SR is an enjoyable, interactive reading experience that occurs when students and the teacher share an enlarged text together (Capillini, 2005; Elley, et al., 1986; Moore, 2015). These texts and activities help children develop strategies and literacy skills necessary for effective and independent reading. Also, group readings help support and respect ESL children as co-readers who feel their mistakes go unnoticed (Hyland, 2005; Mooney, 1994). Moreover, the repeated and choral readings should be lively sessions to develop students' fluency and enhance comprehension (Dowhower, 1987; Elley et al., 1986; Kesler, 2011). The reading texts should be enlarged with attractive pictures to increase enthusiasm for books and students' growing self-esteem as readers (Mooney, 1994, p. 70). Applications of this

programme, which increased momentum in the 1980s and really gained a foothold in the 1990s, has helped significantly in the designing of an Enhanced and Contextualized Shared Reading Approach to help pre-service teachers in the Pacific region teach literacy effectively.

Challenges in Shared Reading

There are several challenges. One is based on the findings by Carss, Tamata, & Exley (2015, p. 1), that “teachers in the Pacific region have often indicated the need for more locally produced texts in both the Vernacular and English”. In the case of Shared Reading, it was a need for the contextualization of texts as the Big Books used for this were too expensive to buy, and the government had no funds to provide such a rich supply of reading materials (Elley et al., 1986). So we find that teachers today are creating their own versions of story books by blowing them up on brown paper, vanguard sheets, and newsprint, with illustrations or cut-out pictures to make them attractive and motivating for students.

The lack of resources for teaching and the lack of competent teachers were among other challenges. Considering the richness of the programme and challenges faced by regional teachers, the Education Department at Fulton College decided to design a contextualized package, which they named the Contextualized Shared Reading Approach (CSRA). This was introduced and trialled by final year Education students in 2013 during their practicum. The result was very positive with convincing stories of how slower readers were picking up momentum and not wanting to miss school. Some parents came to school to thank the students personally for bringing joy and excitement to their children’s lives. Insights from these experiences prompted further improvements into the CSRA programme. Two years later, students trialled it in practicum sessions for their future use. On returning to their island nations, the pre-service teachers should be in a position to teach literacy effectively as the CSRA is applicable to all regional countries. They are also encouraged to uphold the principle to always “think global and act local” so there is abundance of resources and effective teachers to implement the programme successfully.

Appendix 1

Benefits of the Contextualized Shared Reading Approach

The CSRA runs for a duration of two weeks. Based on feedback, we can conclude that it is fun, simple, interactive, efficient, and skills-based. It has been argued that learning is most effective when it is fun (Fisher & Fisher, 2000 cited in Hyland, 2005). Further, it is a simple and effective way to teach English, especially for Pacific teachers who use English as their second language. The following areas have contributed to the success of the CSRA.

Resources are easily and cheaply developed

As noted by Elley et al. (1986) and Carss et al. (2015), Pacific governments and teachers have limited funds to provide a rich supply of reading materials. Thus, pre-service teachers are taught to use readily available sources such as newsprint, brown paper charts, vanguard sheets, magazines, newspapers, crayons/felts, markers, the internet for stories and pictures, stickers, shells, and so on. Large print and colourful illustrations make learning motivating and keep learners interested. The CSRA also allows teachers to choose texts that children will enjoy; for example, fairy tales, legends of the Pacific, Bible stories, classics, newspaper articles, internet sources, and many others as opposed to only class texts.

Appendix 2

Utilises Theory of Multiple Intelligences

Appendix 3

Also integrated into the CSRA is Howard Gardner's Theory of Multiple Intelligences. This theory was developed in 1983 with the belief that individuals possess numerous intelligences which can be presented in many different ways (Lunenburg & Lunenburg, 2014, p. 1). According to the theory, students possess all nine intelligences but differ in the strength of these intelligences. Furthermore, these differences challenge an educational system that assumes that everyone is a "one size fits all" (Kesler, 2010). The CSRA offers a rich variety of activities, and pre-service teachers are encouraged to design different activities to address these individual differences. In support of this theory, Millington (2011) states that songs help learners improve their listening skills and pronunciation, and they can also be useful in teaching vocabulary and sentence structures. Interestingly, Fulton practicum students have confirmed that the part of the CSRA enjoyed most by the students was the singing.

According to Gardner's theory, the memorising of poems comes under musical intelligence and is a very effective means of training the brain to remember things. I remember from my teaching experience, a class six student in 2003 had copied all the stanzas of the poem, "Footprints" in his essay entitled, "A Dream". Like most of the children in the class he had memorised the whole poem and even spelled most of the words correctly. My challenge was whether to award him marks or give him a zero. He had not copied, but had memorised the poem! Additionally, poetry teaches rhythmic patterns which help children learn balance and symmetry. Lunenburg & Lunenburg (2014) explain that teachers can integrate activities for musical intelligence by reciting poetry aloud and clapping to the rhythm of the words and singing folk songs. For these reasons, the CSRA is designed so that children's' different learning abilities are addressed through the multiple activities.

Below are a few examples of shared reading activities designed by the students which are linked to the intelligences.

Appendix 4

Spelling and phonics are integrated

Spelling and phonics are part and parcel of the CSRA programme. They are not taught in isolation. Spelling is used at the beginning to introduce challenging words in the text while phonics is used at the end to help the slower learners recognise letters and words. This continues for a period of two weeks with different activities in both areas so that children understand their story and learning becomes meaningful.

Research by Maddox and Feng (2013) argues that spelling and phonics are advantageous to beginning readers, although the question remains as to which method is more effective. Moreover, McKeown & Beck (2004) add that spelling and phonics activities increase vocabulary learning and comprehension.

Appendix 5

Encourages vocabulary building

In the CSRA, the daily activities designed to help children develop their vocabulary appear in various forms such as using words in a sentence. This is where children use the spelling words from the text to make their own sentences. Another procedure is innovation where children can alter the story by changing characters, actions, places and so on. Picture Stories is when children make up their own story using pictures given in class. This may be done orally or written by individuals, pairs, or groups. An advanced method would be using dictionary skills to look up word meanings, finding similar words, making little words from the big word. For example, from the word “telephone”, children can have the following answers: phone, one, hole, lone, tone etc.

Access to Quality Education Program (AQEP) in Fiji also promotes Shared Reading by running workshops for primary schools. Teachers are taught similar skills and activities that could be used to make learning interesting and meaningful. Vocabulary building skills include rewriting sentences, writing group stories, running dictation, and many more.

Promotes teacher innovation and creativity

As previously mentioned, in the CSRA, the pre-service teachers were encouraged to create enlarged texts that were conducive to learning to establish an active learning environment where children enjoyed being. The created texts included a story, a poem, and a song with ten activities to cover the two weeks duration. Cooper (2001) believes that a variety of texts is needed in order to meet the different needs of students as they learn to read. He discusses six different types of texts beginning with wordless texts, predictable ones, controlled high-frequency texts, decode-able texts, authentic literature, and created easy-to-read texts.

While all of them were relevant, they were more applicable to the Western context except for the Easy-To-Read Texts which were more aligned to our Pacific context in that teachers could construct them easily, simply, and cheaply. He also adds that for second language learners,

these texts provide students who are reading below level the opportunity to practice and apply skills and strategies that they are being taught in texts that they can read. More importantly, they serve as stepping stones to get students into authentic literature (p. 6).

After a number of practical sessions on how to create their own texts, the pre-service teachers constructed the following:

Appendix 6a and 6b

Conclusion

The Contextualized Shared Reading Approach (CSRA) is perceived to be an effective tool to help regional teachers develop the fundamental literacy skills needed for future success of Pacific Island children. With the launching of the CSRA at Fulton, the pre-service teachers struggled to find the appropriate texts for class levels, poems, and songs, not to mention the ten activities they had to design over the two-week period. There was a lot of confusion, frustration, and even discouragement at first but in the process, they learned.

It was during and after practicum that comments on how they wished they had done things better kept arising, giving them the determination for future improvements. More rewarding

was the inclusion of Multiple Intelligence Theory and the ten activities which were designed beforehand to make teaching easier. The CSRA created a sense of ownership, which made a difference in their delivery as they used their own ready-made materials to teach literacy. The trialling of the programme strongly indicates that it really works for our pre-service teachers and would also be an asset to in-service teachers to improve literacy in the Pacific region.

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Appendix 1

Think Global



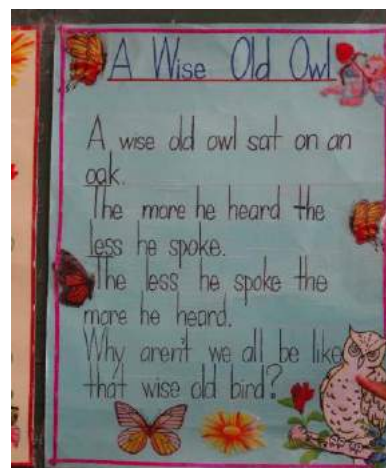
A contextualized setting – Fiji

Act Local



A Western setting for Shared Reading

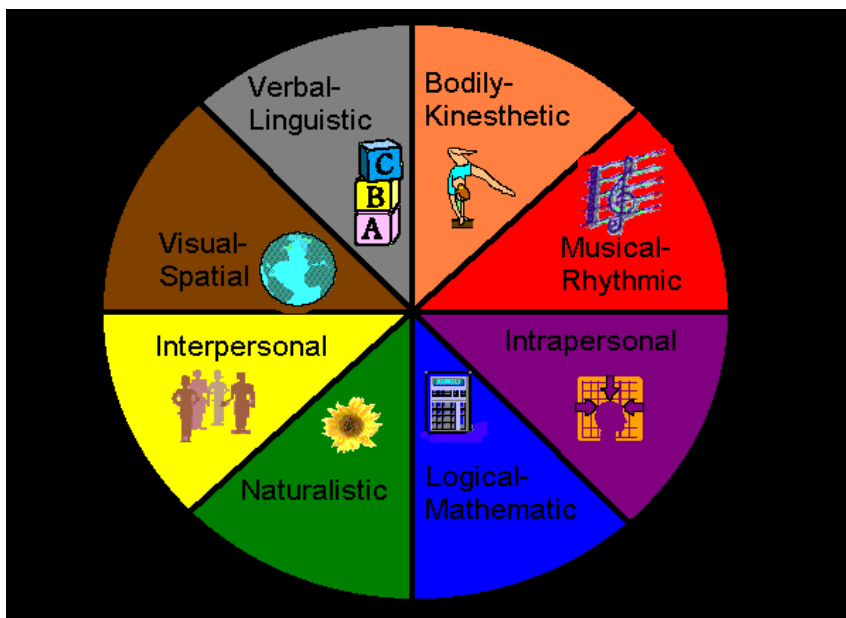
Appendix 2



Appendix 3

INTELLIGENCES	SHARED READING ACTIVITIES (CSRA)
1. Visual-Spatial (picture smart)	Texts with pictures, include drawings with their writing, illustrating poems
2. Bodily-Kinesthetic (body smart)	The use of body language – role play, making things, physical activity, acting out vocabulary (charades), gestures
3. Musical (music smart)	Show sensitivity to rhythm and sound when they learn their song, use musical instruments, clapping, tapping to the beat, singing
4. Linguistic (word smart)	Reading together, spelling words, storytelling, discussing reciting poetry, writing compositions, doing crossword puzzles presentations
5. Interpersonal (people smart)	Understanding, interacting with others through group discussions, group projects, dialogues in groups/telephone conversations
6. Intrapersonal (self - smart)	Understanding yourself, what you feel, and what you want – compose poems, songs, or writing compositions based on topics they are interested in for example, what I want to be, keeping personal journals, create portfolios

Appendix 4



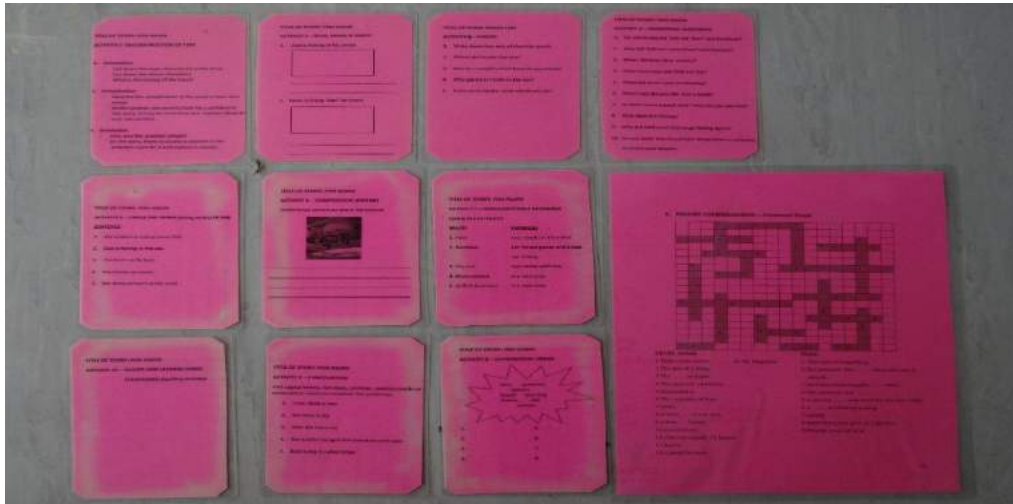
P.S There are other intelligences but the above are selected for the CSRA.

Appendix 5

Spelling activities for CSRA



Appendix 6a



A sample of the 10 activities (can be more)

Appendix 6b



Poem
Six Little ducks
Six little ducks that I
once knew
Fat one, skinny one, little
one, fat
But one little duck with
the feathers on his back
He led the others with a
quack quack quack



Song
All Things Bright and Beautiful!
All things bright and beautiful,
All creatures great and small,
All things wise and wonderful,
The Lord God made them all.
Each little flower that opens,
The little bird that sings,
He made their glowing colors,
He made their tiny wings.



Action Research: Its' Usefulness in Improving Student Learning and Teacher Practice in the Pacific Context

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Abstract

Action research is recognized as an excellent way of doing research in education. It helps discover how best to address educational issues, solve educational problems and test the usefulness of educational theories and practices. This paper defines action research. It then uses two action research projects conducted in the Solomon Islands, and the author's experience of supervising pre-service teachers doing action research in Fijian schools, to illustrate how action research may be conducted in Pacific primary and secondary schools. It also illustrates how action research can greatly benefit all involved.

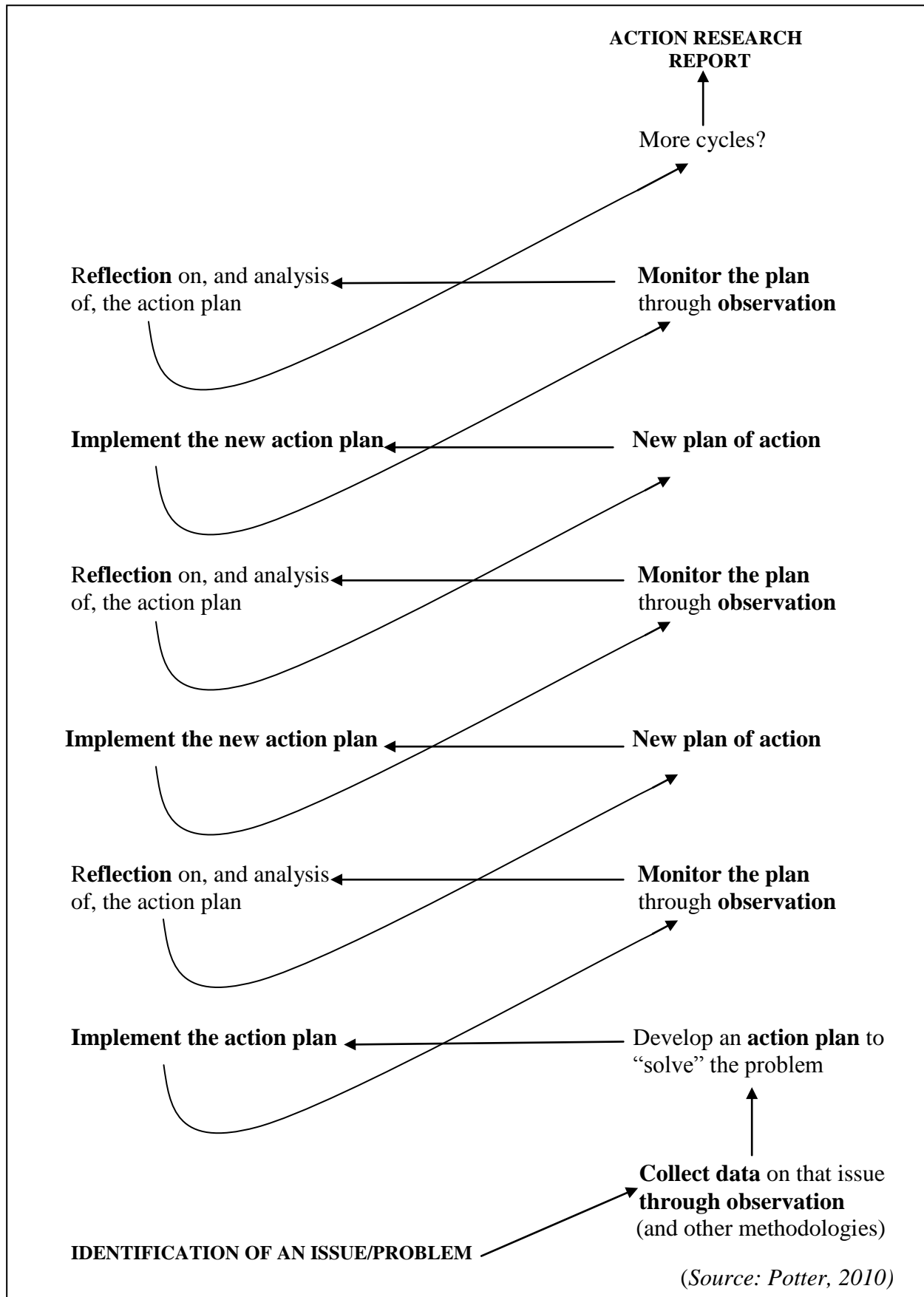
Introduction

Action research is something that thoughtful, reflective teachers wanting to improve their educational practice have always done. Because of its adaptability, it can be used to address educational "problems" in a variety of contexts. This paper illustrates how educational action research may achieve beneficial results in the Pacific context.

Action Research

Before attempting action research, researchers must clearly understand what it is and how to conduct it. Action research "addresses a specific, practical issue and seeks to obtain a solution to a problem" (Creswell, 2014, p. 609). It is also "a powerful, easy to use and versatile tool which encourages the testing of new ideas ... and brings change and improvement" (Potter, 2010, pp. 6-7). Action research in education is when practitioners plan, implement and reflect on a series of actions that are intended to solve a "problem" and thereby improve educational practice (p. 4). However, the experimentation must involve a cycle (better envisaged as an upward spiral) of key processes. This spiral (see Figure 1) begins with identifying a "problem", then proceeds by repeating four sequenced processes – planning, action, monitoring and reflection – until enough data has been collected and/or a solution to the "problem" has been identified.

Figure 1: The action research spiral



Action research is very adaptable, flexible, and practical in its execution and in the application of its findings. Solutions to problems involve “experimenting” with such things as teaching strategies, assessment procedures, and strategies that impact students’ values, attitudes, and behaviour. Data gathering techniques vary greatly (see Figures 2 and 5). While it may be done by individuals, action research more typically involves collaboration between colleagues (Cohen, Manion & Morrison, 2000; Creswell, 2014), which Singh (1995) regards as crucial for success. Like other forms of research, action research should be planned carefully and done rigorously and ethically. However, the emphasis can be on informally reporting results to local educators rather than on formal publication.

Solving educational problems is one benefit of action research. Other benefits include promoting trust and shared understandings among collaborators such that they own and manage the resultant changes (Action Research, n.d.). Thus, teachers who participate in action research enhance and gain some control of their professional development through actively “making” knowledge rather than just passively using it.

Pacific literature also recognises the value of action research. This is particularly true of Pacific teacher training programs (Singh, 1995). In 2007, Koya, Tuia, Faogali and Hodges highlighted the “urgent need for action-based research from both insider and outsider perspectives” (p. 91). The two action research projects I, as a European, conducted in the Solomon Islands arguably represent an “outsider” perspective. I have also supervised Pacific pre-service teachers (arguably “insiders”) doing action research in Fijian primary schools.

This paper summarises these three experiences to illustrate how action research may be done in the Pacific. Two projects were conducted (2001 and 2002) at Betikama Adventist College, a co-educational boarding secondary school of 400+ students in the Solomon Islands. My supervision of action research projects took place at Fulton College, Fiji, from 2008-2014. Insights gained from these experiences are still relevant today.

Action Research 1

Enhancing senior secondary students’ study skills

Issue

Observation of students’ evening study habits convinced me that few students studied effectively. Literature (such as Cottrell, 2013; Hulick, 1989) suggests that study skills programs can significantly improve students’ study habits. Thus, the issue was the poor study habits of a Form 6 class (thirty students), and the remedy trialled was a study skills program.

Purpose and research questions

My purpose was to discover whether teaching Form 6 Arts students how to study would improve their study habits. My questions were:

1. What study skills do Form 6 Arts students already know and practise?
2. What bad (ineffective) habits are impairing students’ study performances?
3. What impact would a study skills program have on students’ study habits and practices?

Methodology and data collection

A study skills program was developed from literature insights and implemented over several well-attended hourly sessions. Students' ten-page booklet focussed on:

- Time – its use and when students should study
- Place – where they could/should study
- Priorities – what they should study
- Study strategies – including setting goals and exam preparation

This action research did not have a series of action plans as such. However, it took three months and included much monitoring and reflection regarding what was being implemented, adopted and achieved, and occasional reminders when bad practices re-emerged. Figure 2 (adapted from Potter, 2010) illustrates my actions and their sequence.

Figure 2: The study skills action research – planning, actions and monitoring

STAGES OF THE ACTION RESEARCH	WHAT THE ACTIONS WERE INTENDED TO ACHIEVE	ACTIONS AND MONITORING
<i>Stage 1</i> Methods that provided background data	Identification of the details and scope of the problem.	<ul style="list-style-type: none"> • Preliminary observations & reflection • Collegial dialogue re: students' study habits & how to reform them
	The creation of a helpful study skills program.	<ul style="list-style-type: none"> • Literature review • Initial survey – what study skills did students know? • Questionnaire to discover students' study habits and needs • Brainstorming with students regarding how to solve issues highlighted by the questionnaire
<i>Stage 2</i> Methods involved in “actioning” the plan	The adoption of effective study skills.	<ul style="list-style-type: none"> • Teaching the study skills program
	Monitoring the impact of the study skills program.	<ul style="list-style-type: none"> • Informal monitoring of study practices during & after the program • Multiple choice survey to “remind” students what they had been taught & to determine if anything was changing • Follow up student questionnaire to determine if and how student study habits had changed • Collegial dialogue re: whether students habits had changed

Findings and discussion

Data collected confirmed my suspicions that few students knew much about good study practices and that many students had bad study habits. After an enthusiastic start, some bad habits reappeared. However, after reminding students how they should study, their practices improved significantly, especially in comparison to the noisy class next door. The following quote summarises the success of the program.

“...many of them (bad habits) decreased or ceased. Also, many new ideas were tried and adopted On a 10-point scale, most students felt their study habits had

improved 3-5 points, with six students feeling they had improved 10 points! This was probably an overstatement, but it certainly indicated a considerable improvement in confidence and coping skills.” (Potter, 2007, p. 31)

One student said, “The program was a chance of a lifetime for me, because it has created a cornerstone for my future learning” (Potter, 2007, p. 32). Thus, the program clearly had a positive impact.

Action Research 2

Teaching junior secondary students through the theory of multiple intelligences

Issue

During many years of secondary teaching I had observed much use of “chalk and talk” teaching strategies using linguistic intelligence, but little else. Howard Gardner’s 1983 theory of multiple intelligences argues that linguistic “intelligence”, while important, is not everyone’s preferred learning style. He argued that there were other “intelligences” through which students can learn, and that teaching strategies utilising these intelligences would make learning more enjoyable and effective, and help students develop new capabilities (Armstrong, 2009). The other intelligences he identified (there are more now) are logico-mathematical, spatial (artwork), bodily-kinaesthetic, musical, interpersonal (working with others), intrapersonal (working by oneself) and naturalistic (learning in the environment). To summarise, the issue/problem was over-use of linguistic intelligence, and underuse or complete neglect of others.

Purpose

My purpose was to teach my two Form 2 classes (40 students in each) a social studies unit – Resources from the Sea – through the theory of multiple intelligences. My research question was simply, “What will happen to student learning and enjoyment of lessons if I teach them using multiple intelligence teaching strategies?”

Methodology and data collection

My methodology was also simple. I studied the textbook provided and used my imagination to develop teaching strategies, activities and resources that would utilise each intelligence at least once. The resources I created were simple and cheap. Books with photographs, music CDs, and my guitar were also useful. The teaching took three weeks. Whilst I planned some activities in advance, I also monitored students’ reactions in order to identify and utilise preferred intelligences through new activities in subsequent lessons. Figure 3 illustrates the range of activities/teaching strategies used.

Figure 3: A summary of activities and intelligences

ACTIVITIES	INTELLIGENCES							
	Linguistic	Logico-mathematical	Spatial	Bodily-kinaesthetic	Musical	Inter-personal	Intra-personal	Natural-istic
Verbal explanations	✓							
Drawing posters in groups			✓	✓		✓		
Making mobiles in groups			✓	✓		✓		
Listening to “mood” music while doing artwork					✓			
Fill in sheets	✓	✓					✓	
Drawing graphs from tables		✓	✓					
Interpreting graphs	✓	✓						
Board game	✓	✓		✓		✓		
Classifying facts	✓	✓						
Songs with a message - catching fish - sustainable development					✓ ✓	✓ ✓		
Researching in books & atlases (for the group)	✓					✓		
Doing sums (group)		✓				✓		
Poster of traditional fishing methods (individual)			✓	✓			✓	
“Spelling” word and number answers for a quiz using cards	✓	✓		✓		✓		
Videos - Marine life - Pole & line fishing in SI								(✓)

Several things should be noted. First, linguistic intelligence was always utilised for instructions. Second, many activities utilised two, three or even four intelligences. Thus, the students learnt through a variety of intelligences each lesson. However, it was neither practical nor necessary to create learning experiences that utilised all intelligences every lesson. Third, with fieldtrips to the sea impossible, two videos were our “virtual” natural environment. Whilst many activities were “exciting”, more familiar linguistic tasks (such as fill-in sheets and copying the results of a classification discussion off the blackboard) provided quiet follow-up activities and notes to learn from. Last, with learning the prime focus, I ensured that activities always provided something students could keep in their exercise books or produced classroom “decorations” to remind them of their learning.

Findings and discussion

Analysis of findings was supported by a pre-action survey (which discovered students’ favoured intelligences), by constant observation and reflection during the action, and by a post-action survey. Students enjoyed most activities, but those they enjoyed most utilised intelligences that link strongly to cultural preferences. Thus, activities using interpersonal intelligence, such as the board game and group quiz, were very successful. The two songs using musical intelligence were a guaranteed four-part harmony success. Intrapersonal was the least favoured intelligence. Students actually laughed at this odd notion when I explained what it was. Thus, I only used it twice in combination with other intelligences.

My findings suggest that teaching through multiple intelligence theory can have a very positive impact on student learning. The impact also exceeded my expectations when, unsolicited, students engaged in group critical thinking to anticipate quiz answers they could prepare in advance. Also:

“Nearly 70% of students said ... they enjoyed multiple intelligence strategies more than “the usual” (chalk and talk) and only 5% said they ... enjoyed it less. Significantly, 80% thought they had learned more through these strategies and none thought they had learned less.” (Potter, 2005, p. 15)

Assignment marks and the unit test (using linguistic, logico-mathematical and spatial intelligences) confirmed this. The students’ happy and eager faces and many unsolicited thanks also underlined the success of the experiment.

Planning and conducting action research

While action research can achieve many things, it needs careful and thoughtful planning and implementation. This final section shares insights gained from supervising teacher training students doing action research projects in Fijian primary schools, and from the students’ perceptions regarding how both they and their pupils benefitted.

Considerations at the planning stage

These include:

1. *Choice of issue.* Observation in schools regarding what is not working well identifies problems (see Figure 4). Posing questions also helps e.g.:
 - Can I make...reading skills...better by...teaching reading using phonics?
 - Would students learn maths better if...I used multiple intelligence teaching strategies?

Figure 4:

EXAMPLES OF ACTION RESEARCH PROJECTS CONDUCTED IN FIJIAN PRIMARY SCHOOLS BY FULTON STUDENTS 2008 – 2010	
Problems observed	Trialled solutions
The vernacular was taught poorly and in an uninteresting way.	A teaching program with many culture-related activities
Students could not read or write at the appropriate level.	Teaching an integrated reading and writing program.
Grade 7 students who could not read. Also, an unresolved debate regarding whether phonics or the whole-language approach should be used for instruction.	A phonics program.
A slow learner who could not read.	Intensive one-on-one tutoring using many bodily-kinaesthetic activities.
Constant “chalk & talk” strategies making maths classes uninteresting and ineffective.	Time, speed and rate were taught through multiple intelligence theory
A boy who could not tell the time.	One-on-one tutoring with many bodily-kinaesthetic activities.

Constant “chalk & talk” strategies making science classes uninteresting.	A science unit taught through discovery learning.
Multi-grade classes are difficult to teach successfully.	Various strategies were tested to discover the most effective method of teaching multi-grade classes.

2. *Scope.* Topics should be small, focussed, have clear boundaries and be achievable in days or weeks.
3. *Participants.* In a school, they would typically be a whole class or a logical group.
4. *Accessibility.* School authorities must know what is being done and give permission.
5. *Ethics and confidentiality.* These are essential to all research.
6. *Understanding the action research spiral.* Action research is not a “one-off” action.
7. *Methodology.* There are many possibilities (see Figures 2 and 5).

Figure 5: Methodologies in action research

DATA GATHERING AND REFLECTION		
<i>Stage 1</i> Methods that provide background data.	a) Methods that help identify a problem and define its extent.	<ul style="list-style-type: none"> • Observation & reflection • Questionnaires & interviews • Diagnostic assessments • School & class records • Collegial dialogue • Sociometry • Mapping • Photography, videography & audio recordings • Field notes
	b) Methods that suggest what could be done to “solve” the problem.	<ul style="list-style-type: none"> • Literature review • Observation & reflection • Questionnaires & interviews • Collegial dialogue
<i>Stage 2</i> Methods involved in “actioning” the plan.	a) Teaching methods/strategies/new assessment styles/classroom management techniques etc. that will be used to try and “solve” the issue/problem.	<ul style="list-style-type: none"> • E.g. multiple intelligences approach, phonics, games, worksheets, group work, field work, thematic teaching, new behavioural management techniques etc.
	b) Methods that can monitor the success and/or failure of each action plan.	<ul style="list-style-type: none"> • Observation & reflection • Questionnaires & interviews • Diagnostic assessments • Portfolios (e.g. of samples of students’ work) • Journaling • Collegial dialogue • Photographs, videos & audio recordings • Field notes etc.

Source: Adapted from Potter, 2010.

How pre-service teachers benefitted from conducting action research

Seven challenging years of supervising pre-service primary teachers doing action research taught me and my students many things and yielded many benefits for all involved. This, and

the next paragraph, summarise the responses to a brief survey given to my 2010 class of eight students to outline what those benefits were (see Potter, 2010).

First, the student teachers benefitted in many and sometimes unexpected ways such as:

- Getting out of their comfort zone and trying “new” things
- Thorough learning of teaching strategies and their relative effectiveness
- Increased understanding of their own and their pupils’ capabilities
- Increased creativity
- Increased interest and motivation (partly due to pupils’ enthusiastic responses)
- More reflection about their teaching

These perceived benefits clearly support claims that action research encourages the testing of ideas, helps teachers understand and improve their practice, and nurtures their ability to actively create knowledge (Cresswell, 2014; Kemmis, 1988; Waters-Adams, 2006). Such benefits are not so readily gained in a lecture theatre or during prescribed practicums.

How pupils benefitted

My students also perceived that their pupils benefitted through:

- Finding learning enjoyable
- Increased motivation and interest in the process of learning (some children requested extra lessons)
- Achieving real learning (children were helped to read their first book)
- Retaining learning

Positive feedback from classroom teachers and parents suggests these perceptions were true.

Conclusion

Action research in education is most simply defined as practitioners improving their practice by thoughtfully and reflectively implementing a series of actions intended to “solve” an observed problem. The action research projects my students and I conducted trialled solutions to problems observable in many schools. They also illustrate how teacher trainees improved their practice and experienced the joy of seeing their pupils benefit. I also improved my practice by running more study skills programs, and by teaching more classes through multiple intelligence theory. Moreover, in 2010, my 2001 experience helped me develop a program intended to equip new tertiary students with effective study skills. My experience of conducting action research projects also proved very helpful in supervising pre-service teachers doing them. Most of my students initially viewed their action research as just another assignment. However, it became something they were glad they did because it brought great rewards for all involved.

These experiences of action research in the Pacific context are useful in another way. Singh (1995) commented how research can bring immediate results. It certainly did for me, my student teachers and the children/students we all taught. However, these experiences also illustrate how Pacific teachers can experiment with and/or invent strategies to “solve” problems observed. Pacific scholars and governments are increasingly calling for teachers to be “critical and constructive in the way they do their work” (Tapo, Daiwo, Rasmussen, &

Timarong, 2007, p. 100). There are also calls for Pacific teachers to “adopt a wide variety of teaching-learning techniques”, to inspire Pacific children to be self-motivated, and to “create learning environments for a diverse range of students” (Buwawa, Tkel-Sbal, Helkena, Moses, & Pa’usisi, 2007, p. 146). Initiating and participating in action research in schools, particularly in collaboration with colleagues, can help teachers accomplish all these things.

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Attracting More Undergraduates to Chemistry – A Papua New Guinean Experience

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Abstract

During early 2000s the number of in undergraduate chemistry programs have been falling in many countries (Steve Connor 2004, Alexandra Smith 2006). It has also been the case, up until last ten years, that chemistry has not been one of the more popular subjects among undergraduates in the University of Papua New Guinea as well. Prior to 2004, only 15% of Science Foundation Year (First Year) wanted to continue studying chemistry. The majority of those who decided to follow chemistry programs did so because they were not accepted by other departments.

About ten years ago, the author set about introducing several measures to make chemistry more attractive to undergraduates. These measures include: the use of information technology, making learning more student-centred by moving away from pedagogy to andragogy, introduction of weekly industrial visits, work experience programs, changing tests and examinations being memory-based to those based on understanding concepts and those based on processing knowledge, and, last but not least, addition of some humour to chemistry. This paper details some of the measures which most probably have led to the significant turnaround in students' attitude and its increased popularity with them.

Introduction

Decline of student numbers in undergraduate chemistry courses have been noticeable in almost every country in the last ten years. For example, in England, chemistry has never been that unpopular (*The Independent*, December 2004). *Nature Materials* published an article in 2006 titled "Where Have All the Chemists Gone?"; *The Advertiser*, too, reported in March 10, 2010 that the number of students studying maths and science is falling to dangerous levels, prompting warnings of a critical shortage in skilled workers, particularly in South Australia. Education Guardian, citing a study, warned on August 16, 2006 that there was a real threat of extinction facing chemistry and materials-related sciences. Until the early 2000s, this trend was observed in the University of Papua New Guinea. 10 years ago, less than 15% of the first-year students opted to do chemistry in the following years. Most of those who decided to follow chemistry courses did so mainly because they were not accepted by any other department. In response to this situation, several measures were taken by the author and his colleagues to make the study of chemistry more attractive to undergraduates.

Measures taken to make Chemistry more interesting to undergraduates

More student-centred lecturing methods and moving away from pedagogy to andragogy

Traditionally, Papua New Guinean children are brought up under strict discipline by their parents and elders, and are taught to be submissive at home and school. In primary and secondary schools, students are taught using teacher-centred techniques. This trend continues at the university level as well. It is not easy to completely change the type of teaching in universities, particularly in the first year as undergraduates are not used to student-centred learning. There is also reluctance among lecturers to switch over to student-centred teaching because they are quite happy to continue teaching in the way they were taught. Majority of

university lecturers are not trained to teach, and most of them do not possess industrial experience which makes it hard for them to change the style of teaching and make courses more industrially oriented and interesting. The author started with treating students as adults. Although there was some reluctance in the beginning, the introduction of oral presentation became very popular with the students. The introduction of group discussions and industrial visits, followed by writing individual reports on the visits, were some of the techniques which proved to be popular with the students. The discussion time after oral presentation was also very interesting because everybody wanted to contribute to the discussion.

Use of information technology

In spite of availability of some IT facilities over the last 10-15 years, most of the lecturers continued traditional ways of teaching such as delivering notes on the black or white boards, and giving hand-outs without much interaction with students. According to feedback from the students they found traditional ways of delivering lectures were boring and also hard to understand. When power point presentations were used, the students appreciated them as they could understand the lectures better and also found lectures were more interesting. Lecture notes placed in the university 'intranet' were also very popular. A computer laboratory for undergraduates in the Department of Chemistry was set up with free internet access. A chemistry textbook titled *A Solid Foundation in Chemistry*, written with easy-to-understand language and explanations to make chemistry concepts easier, was made available at the university bookshop at a very reasonable price.

Testing time: Placing emphasis on processing knowledge rather than memory only

In the past, most of the questions in class tests and semester examinations have been actually tests of memory. When it comes to chemistry, it is somewhat hard to set questions for students to answer without using some memorization. However, to minimize the influence of memory, more multiple choice questions and short answer questions, which required understanding of concepts and logical thinking, were introduced.

Industrial visits and work experience

Weekly industrial visits were arranged to chemical industries in and around the capital city, Port Moresby. These visits were only available to 3rd and 4th (final) year students, as students' numbers in first and second years were high to take them on visits. Besides, managers of industries do not like large number of students visiting their industries at a given time because of safety and other concerns. The industries selected for these visits included a water treatment plant, a brewery, food and beverages factory, a paint factory, a petroleum refinery, a gold refinery and soap and detergent factories. These visits became popular among students when they realized that in industries, what they learn in classroom is used for production of essential items and also providing employment for many of their fellow citizens. After completing 3rd and 4th year courses, arrangements were made for the students to receive work experience in industries. Most of the students, who underwent industrial training programs, were offered jobs and it did not take much time for the news to be spread to the first-year level.

EthnoChemistry

Ancient Papua New Guineans had used chemistry for their daily lives, and have made a significant contribution to science without getting much credit for it. The main reason for this lack of recognition is the absence of documentation. Although Papua New Guinea has over 800 dialects, the absence of a written language made most of their scientific applications go unnoticed. The author had the opportunity to write a new chemistry syllabus for grades 11 and 12, and has been able to introduce a special topic titled “Traditional Chemical Practices of Papua New Guinea”. This topic includes production of several chemicals such as lime, salt, dyes, alcohols and medicines by ancient and current people of this country. The undergraduates have now begun to appreciate what their ancestors have done, and the importance of learning scientific principles in order to improve traditional chemical practices.

Increasing awareness of job opportunities

Papua New Guinea is endowed with a number of natural resources such as natural gas, petroleum, minerals containing gold, copper, nickel and cobalt, and large stock of fisheries and timber. A number of foreign countries had set up industries to extract and process these raw materials. There are significant job opportunities for chemists in these industries. Industries were requested to send their representatives to visit universities for recruiting final year students. As a result, students became aware of the employment opportunities in resource related industries as well as other industries for chemistry graduates.

Management of time

It is of utmost importance for lecturers to manage time effectively. To be in the classroom on time and to start lectures almost immediately is essential as students do not like waiting for lecturers. It is a good practice not to finish lectures too early because if the lecturer is over, in say 40 minutes, students will feel cheated and they don't get the value of money. On the other hand, exceeding lecture duration is worse. Finishing a lecture about five minutes before the scheduled end will allow students to go to the next lecture on time.

Chemistry and humour

When it comes to teaching and learning chemistry, laughter is the best medicine. However, many chemistry lecturers do not realize this, resulting in students getting bored during lectures. The duration of a lecture at the University of Papua New Guinea is usually 60 minutes. The attention span of students is about 20 minutes. This means, the lecturer needs to use every trick in the book to keep their attention during the whole period. Humour and short stories in 20-30 minute increments is helpful. It is not hard to introduce humour to a chemistry class. For example, ionic bonds between negative and positive ions can be depicted as girl-boy relationships. And formation of compounds by two electro negative elements sharing electrons can be represented as girl-girl or boy-boy relationships. ‘OIL RIG’ (oxidation is loss of electrons and reduction is gain in electrons) is an acronym that is good for remembering redox reactions. Before starting a lecture on nuclear chemistry, a lecturer could bring laughter and clearer understanding on nuclear powers in comparison to the power of veto in the United Nations for countries which have lots of nuclear arsenals. There are a number jokes about chemists which lecturers can use when they see the students are getting bored.

Results

At the University of Papua New Guinea, first year students (Science Foundation Year) of the School of Natural and Physical Sciences—about 60 students— are selected for School of Medical and Health Sciences to follow courses, such as medicine, nursing and dentistry, etc. The remainder can choose any of the six departments (biology, chemistry, earth sciences, environmental and geography, mathematics and physics). Out of 500 students, each department can expect about 70 students. However, in 2010, the number of students in the second-year chemistry was 239, which was more than three times the average.

Table 1: No of 2nd year students in the Dept. of Chemistry, UPNG

Year	No of students in the 1 st year in the previous year	No of students opting to study Chemistry in the 2 nd year	% of students from 1 st year (foundation year) Opting for Chemistry in the 2 nd year
2005	375	74	19.7
2006	400	89	22.3
2007	430	102	23.7
2008	475	126	26.5
2009	500	186	37.2
2010	500	239	47.8

Table 2: No of students enrolled for Physical Chemistry course, UPNG

Year	No of students taking Physical Chemistry in the 4 th year
2004	2
2005	8
2006	18
2007	29
2008	45
2009	54

Discussion and Conclusion

As shown in Table 1, the number and the percentage of students opting to study chemistry in the second year has been steadily rising during the past six years. Physical Chemistry was not a popular subject in early 2000s. Many students had considered it a difficult and boring subject. According to Table 2, there is a significant increase in the number of students enrolling for Physical Chemistry as well.

The Author does not attribute this increase of students' numbers for chemistry courses entirely to the change of teaching techniques and other measures taken by the Department of Chemistry. There may have been other factors. However, the increase of percentage of students deciding to study chemistry with respect to first year students is remarkable and surely has its basis at least to some extent in the practices outlined in this paper.

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Vaka Pasifiki

Start Doing...

Stream 3



Pacific Models for Teacher Learning: A Study in Kiribati

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Abstract

It is claimed that effective professional development that instigates positive change in teaching practices must be ongoing, job-embedded, and relevant to individual teachers' needs. The research study reported in this paper explored this concept of continuous professional development in the remote Pacific island country of Kiribati to inform developing a sustainable model that will facilitate change in teaching practices and contribute towards learning for accredited teaching qualifications in Kiribati and the Pacific region. The study used a project-based and school-based approach incorporating key components of the changing education environment in Kiribati. The teachers were required to work collaboratively exploring different pedagogies, problem solving, and integrating ICTs in the process. Although none of the five teacher groups completed the final phase of the project activities, the findings are extremely informative. Many education systems and practices in the Pacific region are adopted from developed countries, and do not account for local and regional cultural influences such as those revealed in this study of teachers in Kiribati: the role of leaders, respect for elders, restricted knowledge, and priority of obligations. Thus, it is argued that the contemporary education system in the Pacific region is hampered by continually implementing systems and practices from developed countries without changes to reflect the local context. This research study is important and supports the call for developing Pacific models, which acknowledge cultural practices, values, and beliefs including traditional knowledge.

Keywords: continuous professional development, Pacific models, school-based teacher learning, collaborative work practices, cultural influences

Introduction

Teachers are at the heart of every education system. Plans and strategies for the initial preparation and on-going professional development of teachers are central elements of the process for achieving goals and targets relating to quality, access, and equity in education (Pacific Islands Forum Secretariat, 2009, p. 13).

The importance of Continuous Professional Development (CPD) to promote quality teaching has been well-acknowledged at a global level, as well as the Pacific region (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Desimone, 2009; Desimone, Smith, & Phillips, 2013). At the same time, it is claimed that effective CPD that instigates positive change in teaching practices must be ongoing, job-embedded, and relevant to individual teachers' needs. The research study reported in this paper explored this concept of CPD in the remote Pacific island country of Kiribati. In particular, the study explored CPD as a means for teachers to gain knowledge and skills needed to meet the demands of ongoing change in the education sector. The rate of change in Pacific education has gained momentum in recent years; with new policies, curriculum, legislation, and general need to change education to introduce new topics, such as climate change and ICTs, to refocus education to be more relevant, and to move away from teacher-centric approaches towards student-centred learning.

Furthermore, in 2014 the secondary schoolteacher workforce in Kiribati had approximately one hundred untrained teachers (those who did not have the required teaching qualifications), which comprises one third of the total secondary schoolteacher workforce². In 2014, the new Kiribati Education Act (Ministry of Education, GoK, 2014) was approved with a requirement that teachers must be qualified.

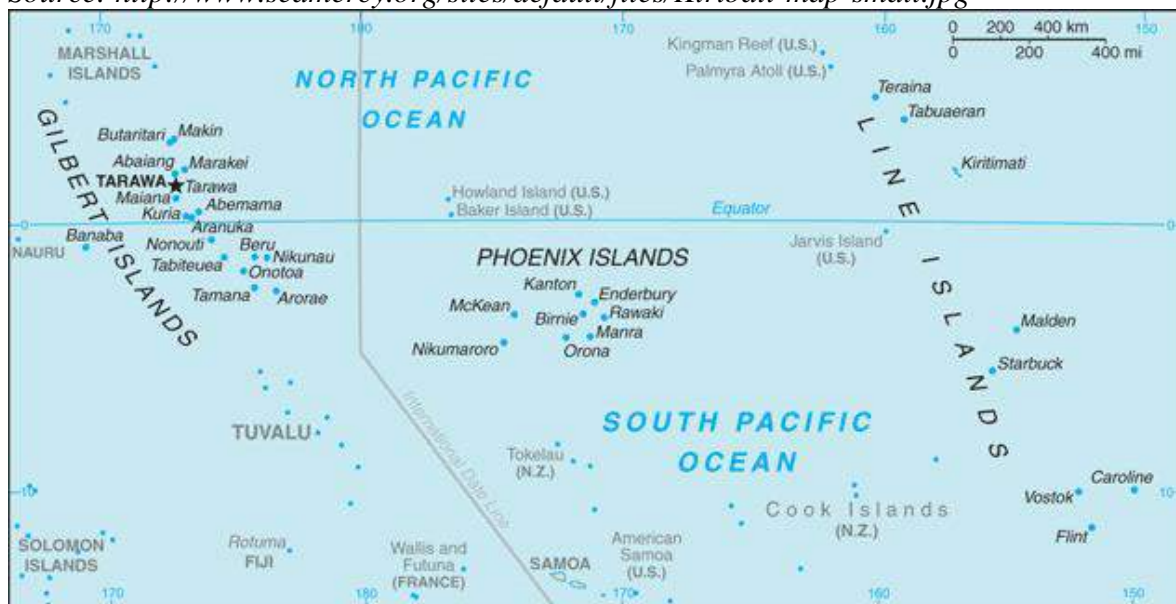
The purpose of this small study of twenty-eight I-Kiribati in-service secondary school teachers was to gain understanding of these teachers’ capabilities to engage in school-based learning. This study aimed to inform a model for continuous professional development that will facilitate change in teaching practices, and contribute towards learning for teaching qualifications in Kiribati and the Pacific region. The key research question was: What is the capability of in-service teachers to engage in effective school-based learning?

Background and context

Kiribati is a country of 33 atolls and low-lying reef islands scattered across the equatorial region of the Pacific Ocean, in three main island groups (see Figure 1). Tarawa is the capital and largest atoll in Kiribati. In the 2015 national census, the population of Kiribati was recorded at 110,110 (Kiribati National Statistics Office, 2016). The huge spread of tiny land mass presents unique challenges to Kiribati and education in the country.

Figure 1: Map of Kiribati

Source: <http://www.seamercy.org/sites/default/files/Kiribati-map-small.jpg>



Kiribati is recognised by the United Nations as the “least developed country”. Although extreme poverty is not common, many households have difficulty meeting basic needs with the country having a constant high unemployment rate of sixty percent (UNCTAD, 2014). Accordingly, the I-Kiribati community and family structures operate on strong support systems that include income sharing. Teaching provides comparatively secure employment and teachers are respected community members responsible for supporting an extended family.

2. ² Untrained Teachers Project 2014 report: School of Education, The University of the South Pacific

Teacher Development

The Kiribati Ministry of Education Sector Strategic Plan (ESSP) 2012-2015 reflects government commitment to improved education outcomes, which align with international development goals, the Pacific Education Development Framework, and the Kiribati Development Plan (Ministry of Education GoK, 2012). Goals in the ESSP pursuing the delivery of quality education include “all students in Kiribati [who] are taught by committed, competent and effective teachers supported by effective school leadership” (Goal 3, p. 10). Furthermore, the planned approach states that “the focus is to move away from the centralized training model at Kiribati Teachers College to a decentralised delivery of a professional development programme that is school based” (Ministry of Education GoK, 2012, p. 11).

In Kiribati funding for teacher professional development is primarily the responsibility of individuals, schools, and governing authorities. Government funding includes an annual AUD\$15,000 grant to each of the four church groups for teacher professional development. In addition, the Ministry of Education provides needs-based workshops generally adopting a “train the trainer” approach. At the same time, development partners continue to provide ad hoc training to support global trends such as introducing new technologies for teaching and learning.

Continuous Professional Development

Continuing professional development is a broad term, and includes various models and forms; such as in-service training workshops and school-based professional support, including projects, portfolios, mentoring, collaborative lesson planning and lesson study, co-teaching, and peer learning such as teacher study groups (Cordingley, et al, 2007; Darling-Hammond, et al., 2009; Desimone, 2009; Sayed & Naylor, 2014).

A rigorous literature review, commissioned by the Department for International Development, United Kingdom, that focused on pedagogy, curriculum, teaching practices, and teacher education in developing countries suggests a shift in focus and funding to professional development to support new reforms and pedagogies (Westbrook, et al., 2013).

The shift towards school-based teacher development advocates innovative uses of ICT as particularly appropriate, especially for rural areas, exemplified by use of the internet for a wide range of teaching and learning resources (Jara, Clara, & Martinic, 2012; Moon, 2007; Thakrar, Zinn, & Wolfenden, 2009).

Changing landscape

In Kiribati and many Pacific Island countries, the key twenty-first century reforms impacting on teaching practices are associated with new national curriculum frameworks. At the same time, the Kiribati Ministry of Education has committed to advancing ICTs in the schools through the recently revised Kiribati Education Improvement Programme (DFAT Australia, 2015).

Further global reform that is impacting teacher learning is the shift from an emphasis on the individual towards the concept of teacher-learning communities; recognising the importance of social engagement arising from the particular contexts and institutions in which teachers practice (Lave & Wenger, 1990; Shulman & Shulman, 2004). This argument states that

learning occurs when learners participate in activities that are ideally situated in authentic situations. Thus, for in-service teachers this learning should occur in their classrooms and schools.

Theoretical framework and related literature

Pedagogy

Teachers' thinking and ideas are manifested in their overall pedagogic approaches, gathered from their own learning experiences as school students themselves; in addition to the approaches promoted in pre-service teacher education and in-service training, those specified in the current school curriculum, and those pervasive in colleagues' classrooms. Less explicitly, pedagogic approaches are also informed by theories of learning, such as social constructivism which, in turn, inform an understanding of teacher behaviour, particularly teaching practices.

A social constructivist view of identity

Constructivist approaches to teaching developed in recognition of the diversity of student needs and the need for teaching to support an inquiry approach in the learning process.

Based especially on the work of Piaget (1896-1980), constructivism theorises the mind as inherently structured to develop concepts and acquire language. Constructivist approaches see that activities are provided to build on a learner's current knowledge, and challenge them so that through the process of accommodation, they continue to make progress in their learning. Individual and group work centred on problem solving and project work is appropriate in constructivism (Westbrook, et al., 2013).

Social constructivism sees knowledge as socially constructed and learning as essentially a social process. It is mediated through cultural tools, above all by language, and facilitated by drawing on examples or contexts familiar to the learners so that meaning-making is prioritised. Student or learner-centred pedagogy can be theorised, as influenced by social constructivism.

Description of the study

Research methodology and scope

The study reported in this paper adopted a qualitative approach in data collection, analysis, and presentation. This approach employed interpretivism as the overall theoretical paradigm. Interpretivism, in this context, considers the research participant – the teacher – as an active agent who constructs his/her own meanings of reality (Mack, 2010). This approach also aligns with the social constructivist paradigm underpinning the conceptual framework for the study. The study used a project-based, collaborative activity to investigate the notion of school-based learning for teachers. The project comprised three main activities: identify a school-based need for new or improved pedagogy, plan and develop a strategy to introduce the agreed pedagogy, and present the proposed change strategy to all teachers in their school. The project also required the teachers to use ICTs to facilitate the required collaboration. This project spanned a period of twelve months commencing in April 2015. During this time, the researchers visited Kiribati on three occasions and collected data.

Research sites and participants

The five participating schools were all known to the researchers and located in the densely-populated area of South Tarawa. Information on the research study was verbally presented by the researchers to all teachers and school principals. Subsequently, twenty-eight teachers from five secondary schools volunteered to participate in the study. These teacher-participants represented varied ages, experiences, and qualifications. It was considered important to have a diverse group of teachers since the project activities required a sharing of different views (See Table 1).

Table 1: Teacher participants

	Gender		Age Range					Teaching Experience (years)				Highest Qualification C= Certificate; F=Finished UF=Unfinished				
	M	F	20-25	26-35	36-45	46-55	56+	1-5	6-10	11-15	16+	C	Diploma		Degree	
													F	UF	F	UF
A	2	6	1	6	1			4	4			2	1	2		3
B	3	2		2	1	1	1	2	1	1	1	1	2		2	
C	1	3		4				3	1				1	3		
D	2	3	1	2	2			3	2			2		3		
E	2	4	4	2				6				2	1	1	1	1
#	10	18	6	16	4	1	1	18	8	1	1	7	5	9	3	4

Data collection and analysis

The researchers initiated the study with focus group discussions at each school, and administered questionnaires to the twenty-eight participating teachers and five school principals. Focus group and individual interviews with teachers were conducted during interim and final visits by the researchers. None of the teacher groups completed the final stage of the project. Nevertheless, they all reported a positive view on collaborative work practices, using ICTs in teaching and learning and, in particular, school-based learning.

Since the study involved collecting data from humans, ethics approval was obtained from the required organisational Human Research Ethics Committees, the Kiribati Ministry of Education, and Kiribati church school education authorities.

Findings and discussion

In order to explore how in-service teachers engaged with the learning activity, the findings were examined from the perspective of the three key emergent themes. These themes reflect critical cultural influences, which limit the capability of the teachers to engage in school-based learning activities. These three themes – leadership role of the school principal, collaborative work practices, and social obligations – are discussed with the view of them being important constants, which will continue to affect future development work with teacher learning in Kiribati and the Pacific region.

Leadership role of school principals

Although the principals' support and commitment had been obtained at the commencement of the study, they did not take an active role in monitoring and supporting the project activities. The findings suggest teachers are reluctant to initiate activities unless instructed by their school principal. One teacher commented, "I thought that the principal would tell us what to do since they were at the first meeting we attended". This is in contrast with situations in developed countries, where teachers have long been encouraged to be independent leaders demonstrating initiative, entrepreneurship, and proactive approaches in their classrooms and schools (McGree & Boyd-Dimock, 1995; Westbrook, et al., 2013). On further analysis, it is contended that cultural beliefs and systems of leadership in Kiribati have a strong influence on the situation.

Traditional leaders in Kiribati were called *unimane*³. The *unimane* were leaders of family groups and their seniority was considered to give them wisdom to make good decisions for all. The system of *unimane* leadership remains significant in the villages in Kiribati in the present day. This is evident in the *maneaba*⁴ system where *unimane* are considered wise and honorable and must always be respected. There is a belief that disrespecting the *unimane* will result in being cursed or bad luck. This belief remains fundamental to the practice of respecting leadership and older people in Kiribati society. Thus, regardless of age, a school principal receives a high level of respect from all staff and unquestioning compliance with their decisions. For a teacher to suggest a change without being asked by the school leader is considered dishonourable to the leader.

Collaborative work practices

Although it is often asserted that the collaborative nature of village and community life in Pacific Island countries supports natural collaborative work practices, the findings of the study reported here do not support this notion. At the commencement of the study there was extensive discussion between the researcher and the teachers on ideas for collaboration such as using social media, group reflections, and buddy systems. Nevertheless, the teachers did not engage in collaboration for the project activities.

Kiribati society is based on communal living and participatory processes involving the *maneaba* system, where people and families within a village work together, share and cooperate with each other to survive and maintain good order within their communities and islands. Although 21st century living in South Tarawa suggests traditions are not followed rigorously in modern times, traditional knowledge is still considered relevant. One important aspect of traditional knowledge in Kiribati is secrecy (Teaero, 2003).

Traditionally the *utu*, (extended family groups) had specialist secret knowledge, which resulted in interdependence and equality in the community (Tito, Tiata, Teanako, Fakafofo, & Tautua, 1979). Tito et al. (1979, p. 14) explain that although everyday skills necessary for traditional life were common in traditional society in Kiribati, particular families had special expertise, which were family secrets and "would be used for the benefit of others in return for other skills". The one person who possesses the knowledge and skills is called the *boto* and is responsible for passing the wisdom to the next *boto*. If no one from the family is trusted

3. ³ an old man

4. ⁴ a meeting house where issues of social, political and economic issues are discussed

enough to be given this special knowledge, then it is considered nobler for the knowledge to be buried rather than passed on to outsiders or those who may not be trusted.

There are several consequences of this “restricted knowledge” for contemporary learning in Kiribati. One such concern relates to the commonly used model for teacher professional development, known as “train the trainer”. This model relies on the transferring of knowledge and skills teachers gain in workshops or other events to their school-based colleagues. Although this model has been held to be highly successful in developed countries, the system of restricted knowledge in Kiribati suggests a barrier to effectively using this model for teacher professional development. At the same time, there is support for the notion of school-based learning, but conflict with the notion of collaborative work practices.

Social obligations

All the teachers interviewed during the final phase of this research project identified issues related to time when reporting on their progress with the collaborative learning activities. Teachers made comments such as, “We work from 8:30 a.m. until 6:30 p.m. teaching classes”, and “When I have my free period for preparation each day, the other teachers are all working so there is no time for working together on anything”.

When these claims were investigated further, it was revealed that three of the five schools were significantly understaffed and at the same time had limited classrooms available. Accordingly, to manage the situation the schools timetabled senior students to attend classes in shifts. At no time did the principal direct that school time could be taken for collaboration as it was assumed that the teacher-participants would work this out for themselves.

As respected community members, teachers are important members of the *maneaba* system and have obligations and responsibilities to community and church, in addition to meeting family commitments. These social obligations limit time available to engage in further learning outside school hours.

School-based learning for teachers is globally advocated as effective teacher professional development in developed and developing countries (Westbrook, et al., 2013). It is considered most effective due to enabling a social constructivist approach where teachers can learn in real situations. Nevertheless, the teachers in Kiribati reported that they did not have time to engage in school-based learning.

Conclusion and implications

The objective of the study reported in this paper was to explore the capability of teachers to engage in school-based learning to facilitate change in teaching practices, and enhance further learning for accredited teaching qualifications. At the same time, the study aimed to explore the notion of school-based learning as a sustainable model for teacher continuous professional development.

Based on the findings and analysis of this 2015 research study with secondary school teachers in Kiribati, it is suggested that a model for continuous professional development for teachers show most promise if:

- Training in teacher professional learning for Principals is provided.

- Pacific models of teacher continuous professional learning are developed.
- Teacher professional learning policy is introduced.

Suggestions to further the development of an effective Pacific model include the following:

- A regular programme for classroom/school-based teacher development is introduced and supported by the Ministry of Education with an allocation of time away from school/teaching duties.
- Future school-based initiatives and activities aimed at change for teaching practices in Kiribati and the Pacific region are strongly supported and monitored by the school principal.
- School-based teacher professional learning is continued to be investigated as a suitable means for developing skills and knowledge for teachers in the Pacific region.
- Future initiatives and strategies for teacher learning in Kiribati and the Pacific region are designed and endorsed with input from persons with knowledge of local culture and tradition.
- Alternative professional learning for teachers in the Pacific region continues to be investigated with further research on different strategies such as online courses, mentoring, peer assessment, and various support mechanisms which may or may not include school-based learning.
- Further investigations on professional learning for teachers in the Pacific region incorporate using ICTs to support development of all new learning. School-based teacher development encourages innovative uses of ICT as particularly appropriate for outer and remote islands exemplified by the increasing use of open educational resources.

Although this study was limited to the one remote Pacific island country, similar cultural influences throughout the Pacific region facilitate the transferability of these findings. Additionally, the strong regional approach to education reform in the Pacific region provides a common approach to changing policy and practice (Pacific Island Forum (PIF), 2015).

Many education systems in the Pacific region are adopted from developed countries, and do not account for local and regional cultural influences such as those revealed in this study of teachers in Kiribati: the role of leaders, respect for elders, restricted knowledge, and priority of obligations. Thus, it is argued that the contemporary education system in the Pacific region is hampered by continually implementing systems, and practices from developed countries without changes to reflect the local context. These findings support the call for developing Pacific models which acknowledge culture, including traditional knowledge.

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Facing space: Video in a dialogical research framework for success in Pasifika boys' secondary education

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Abstract

The literature of Pasifika Education – the education of students of Pacific origin in Aotearoa New Zealand – is replete with references to the importance of relationships. Advice derived from this literature and given to teachers includes building relationships and developing a detailed knowledge of students. While no one would doubt the significance of relational activity, nor the helpfulness of this kind of advice, this paper asks how attention to relationships can be framed in a way, which is Pacific.

The focus of the paper is a brief description of video mihi (greetings) as a method of supporting inter-cultural relationships in schools. The argument embeds this method in a theoretical framework which focusses on response, whilst also embracing cultural ways of understanding. It also considers the possibilities and limitations of video mihi as a tool in a mediated dialogue methodology. Initial results suggest that using new technology to achieve old ends is something we should start doing, both as researchers and teachers. However, it is also suggested that re-framing thinking about Pasifika education in a way that is Pacific is unlikely to come from personal response to students alone. It requires a conceptual shift capable of disturbing existing understandings. Conceptual resources are required for this.

Introduction

Pasifika education is generally seen as the education of students who have a background in one or more Pacific island culture and who lives in Aotearoa, New Zealand (Otago Online Information Literacy, 2007). The concept is disputed as an imposition, and there are calls for ethnic specific research (Airini et al., 2010), but in some circumstances it can be of value to people of the Pacific diaspora. One of these circumstances is where a small number of Pasifika students study as a minority in a school. Here, unity can bring strength in a way which recognises the kinds of pan-Pacific relationships which exist in lived experience (Tupuola, 2004).

For a *palangi* (foreigner) researcher, the concept of Pasifika is further complicated by the ethics of positionality and the history of colonialism. A further relational issue arises when a researcher seeks to research in their own institution or school-family. This brings in the dynamics of developed relationships (Lincoln, 1995) – including those with the Pasifika community – which can be beneficial, but which make demands on reflexivity.

Despite these complexities, as a teacher and academic of Anglo-Welsh extraction with a history of working in the Pacific, I seek to support Pasifika education in my school. I am leveraging a PhD study for the benefit of the school's Pasifika community in ways which I hope will head the call to make "a difference to Pasifika education" (Visser, Unasa, Kennedy, & Airini, 2007) both in the institution and on a wider scale.

About 6% of the students and 3% of the teachers of my school are Pasifika. Here, as elsewhere, Pasifika parents send their students to be educated with palangi colleagues by palangi teachers. The reason for this is a research question in itself. As a result, however,

Pasifika education involves inter-cultural relationships. Therefore, it is relevant to ask what Palangi teachers need to know to better support the success of their Pasifika students and, in this digital age, to examine the part of how new technologies can play in this.

The methodological framework being employed leans on Bakhtin's understanding of life as dialogical (Todorov, 1984), a perspective which aligns well with the importance placed on relationships and dialogue in the Pacific Way (Airini et al., 2010; Crocombe, 1976). One method I have been using is to facilitate dialogue using video. Video, including “selfie” videos, made on iPads or cheap smartphones, is an everyday part of life for many young people.

Background

Research tells us that the relationships between teachers and students are the key to Pasifika educational success (Hattie, 2003; Hawk, Cowley, Hill, & Sutherland, 2002; Hawk & Hill, 2000). High quality relationships can lead to students feeling comfortable, feeling safe, participating, taking risks, and, if there is effective pedagogy, learning. Although Samu (2013) and Siteine (2010) sound notes of warning regarding the way Pasifika identity is constructed in school-based relational activity, anything researchers and teachers can do to support fulfilling relationships between Pasifika students and Palangi teachers is a contribution to Pasifika education.

Two years ago, I presented a paper at the Vaka Pasifiki conference in Tonga (Reynolds, 2014), explaining a plan for catalytic action-research which is now almost completed. I outlined an idea of using videos made by students as communication with their teachers. The plan was to ask new and young Pasifika students to make a video before they joined their secondary school. A team at school planned that the videos would be made as a joint venture with senior Pasifika students, on a Pasifika induction day.

At that time, I argued that self-made videos had the potential for Pasifika students to: talk from own world view, bring their past successes to their new school, imagine their goals and aspirations, and celebrate themselves. These are worthwhile goals driven by emancipatory and critical ideas. In the school, we called the videos “*video mihi*”. *Mihi* is a Maori concept, which means to give a formalised greeting. The technology we used—the free version of VideoPad—limited each video mihi to one minute. Short videos are more likely to be watched by busy teachers.

Palangi teachers understand the western world, but in inter-cultural education one needs to understand the worlds of their students. At the very least, in Pasifika education, they need to have some idea about how Pasifika students see themselves as learners, and about what they expect from their teachers and schools. In 2014, I had hoped that any videos watched by teachers would have the potential to begin to transform relationships by giving teacher-student relationships a positive start, giving the first word to the student, helping staff to individualise their Pasifika students, and creating accountability for the teacher to help deliver students' goals. Through the research process, the question driving the work narrowed from an inquiry about the knowledge required by teachers for effective inter-cultural education. It now asked about the knowledge required by teachers regarding their Pasifika students in order to support Pasifika success as a Pasifika a teacher. This change occurred as students' voices became theorised as an opportunity to develop a concept of Pasifika success.

Before new students begin at secondary school, they are often known by their test scores. This information is always interpreted and absorbed into existing schemata derived from experience, the media, and/or history. Poor scores, therefore, can be perceived as coming from someone who is Pasifika, came from a primary school in a poor area, is like their sibling, is disengaged, or has no ambition. On the other hand, good scores are seen to come from students who have caring parents, is a genius, is middle class, etc. Interpretations may be subject to the deficit theorisation which research suggests is common in Pasifika education (Alton-Lee, 2003; Gorinski & Fraser, 2006; Spiller, 2012). I hope that through video mihi, students speaking for themselves would challenge stereotypes and produce change.

Video mihi

The essence of the stereotypes regarding Pasifika life is displayed in the title of a recent report, "More than Churches, Rugby & Festivals" (Tanielu & Johnson, 2013). Stereotypical ideas about Pasifika education focuses on un-deconstructed accounts of less than optimum achievement levels. Far from challenging these stereotypes, the videos were full of information about success in sport, the importance of family, church, and difficulties with literary and numeracy. At this point, with a computer drive of 13 videos, there was a moment of panic for the teacher/researcher. Were the video mihi more likely to reinforce stereotypes than unsettle them when they were watched by teachers?

The methodological framing of the video mihi method focusses on creating a mediated dialogue. According to Bakhtin (1981), a dialogue is "an ongoing chain or network of statements and responses...in which new statements presuppose earlier statements and anticipate future responses" (p. 363). Mediation is a process whereby an intermediary brokers power in a particular circumstance. In schools, there is a sense of power, of what you can and can't say. Technology was used to begin a dialogue between student-teacher dialogue, although the teachers were absent during filming. The theory was that, by their absence, teachers' power over the dialogue would be diminished.

The moment of panic described above conceptualised the video as a one-way stereotypical statement, forgetting the dialogic theoretical framework in which it was embedded. However, when teachers watched the videos they did not just listen to students' words, but watched the videos as visual text, appreciating of rhetoric (Hocks, 2003). They got meaning from the images, the tone of voice, the objects students chose to be videoed next to, etc. As a result, teachers were able to dig beneath the surface of the stereotypical verbal information and to individualise.

Teachers responded on three levels. Data was gathered regarding these levels through interviews with each teacher, after they had viewed the videos of the students, they would soon be teaching. For the purpose of analysis, the three levels were termed instrumental, personal, and affective. Each level of interaction may be worthwhile in its own way, but at some levels there is a greater sophistication of response.

Teacher Responses

At the instrumental level, teachers appreciate the value of information as opportunities to shape teaching to student interest. For example, many students named a church and a teacher's instrumental response to this, "*(I might) go in with 'I know that there's a number of you that belong to this church or that church...what are some of the values you can talk about?'*"

In an instrumental response, the information contained in the video mihi presents facts about a student. The response is generally focused on the curriculum. This level of response is very similar to advice often given to teachers; to talk to their Pasifika students about rugby, etc. It's a way of making connections which can be valuable, but does not make the conception of Pasifika education any more Pacific.

The second level of response is personal. For example, several teachers saw leadership abilities in one or more students, and valued the person of the student because of these. By associating a student with leadership, positive expectations for the future were created. For example, *"I'd expect him to be enthusiastic and maybe bring some of those leadership qualities that he talked about into the classroom"*.

Often, the qualities of students valued by teachers were not the result of student words in the video, but of comportment, bearing, or behaviour from the visual text. For example, *"He has presence, a personality, and he projects it so there's a leadership element there"*.

At the personal level, teachers value something about the student, seeking to develop the qualities which a student brings to school. A personal response is student-focused, not fact- or curriculum-focused.

A third level of response is affective. At this level, teachers respond with emotional concern, warmth, or emotional anticipation. This was indicated in the interviews by words which contain emotion and appreciation such as *"lovely"*. In this inter-personal and relational response, the focus is on how the teacher feels about the student. For example, *"I feel quite connected to him immediately. I like him. Watching the video, he is really cool"* and, *"I feel for him. I really want to help him. I really want him to enjoy his time here, and see success. I think that's the most important thing."*

Where students talked about their needs, this often elicited an emotional response.

By making it possible for students to make video mihi and by organising space for teachers to watch these before any physical meeting, some of the goals outlined above were achieved. Those such as self-celebration, which ascribe power to student voice, unconstrained by the presence of a teacher, were particularly evident.

Critique

Because some of the critical and emancipatory goals for the method were achieved, it can be claimed that video mihi as an element in a dialogical methodology has potential, and that it is worthwhile repeating. However, providing teachers with opportunities to find out facts about, appreciate the strengths of, and emotionally respond to Pasifika students has limitations. The method has the potential to support relationships, but it does not offer cross-cultural understanding. It fails to make Pacific understandings of Pasifika education available in ways which can challenge existing thought and practice.

To move further, the research turned to *va* and to the voices of students and parents; not about themselves, but about teachers and teaching. This switched the teacher education embedded in the research from learning *about* Pasifika students to learning *from* Pasifika students and their

worlds. The research question now included what teachers need to know about Pacific concepts in order to understand their Pasifika students.

Va

Va is a Pacific relational concept, usually discussed in the context of Samoan or Tongan culture. Without doing sufficient justice to the concept, it may briefly be offered as one way of disturbing a European relational world view. By learning about another way of thinking, we can learn about ourselves. This is what being inter-cultural may mean.

Va has been described by a number of Pacific writers. Ka'ili, a Tongan researcher, says that *va* "emphasises space in between. This is fundamentally different from the popular western notion of space as an expanse or an open area" (2005, p. 89). Mila-Schaaf, a New Zealand-born Tongan, writes that a "focus on *va* leads to an examination of our interaction with others; a focus on our intentions and conscious actions that influences the nature of our relationships with others" (2006, p. 11). Further discussion can be found in Reynolds (2016), Anae (2010), Lilomaiava-Doktor (2009) and elsewhere.

Perhaps a partial essence of *va* can be captured in Hau'ofa's (1994) comment that islands are both connected and separated by ocean. Thus, it is with classroom relationships. Some Western views see no relationship and no obligation beyond teaching unless it is built or developed. In this view there is no relational self (Giddens, 1991). A *va* lens sees a classroom always filled with relationships at physical, social, and spiritual levels. Positive activities intensify these, and inaction or negative activities damage them. There is no neutral ground.

After the video mihi part of the research, I was able to run a short professional development cycle of six meetings with 11 staff at the school. We asked Pasifika students and parents to describe what they thought palangi teachers needed to know about the Pasifika community, teachers, and teaching. The students developed a taxonomy of features of "kind" and effective teachers, which mirrors the Effective Teacher Profile developed by Bishop and Berryman (2009). This includes attention to comportment, power and respect, environments in the classroom, and the clarity of teaching judged by the effectiveness of learning. Pasifika parents suggested that the ideal Pasifika student-teacher relationship should be mutual, respectful, positive, encouraging, focussed on learning, involve trust, and having the teacher behaving as an adult.

By first learning a little about *va*, and then trying to understand through a *va* lens what the parents and students had said, teachers, including myself, tried to understand teacher-student relationships from a Pasifika position. We tried to see how ideas associated with *va* – such as reciprocity, obligation, and a desire for harmony – might shape Pasifika expectations. We also tried to understand spiritual and emotional connections as a background to teaching and learning. This often focussed on reshaping power in the classroom, and led to a fourth level of response, self-examination.

Self-examination

At the end of the professional development programme, teachers were asked to make a video mihi for the Pasifika community, to account for their learning. Through these, a level of response to Pasifika education emerged which involves the beginnings of a reframing of the teaching and learning situation. This reframing embodies aspects of *va* as outlined above.

Seeing learning as a joint project—a result of re-thinking the flow of power in the classroom—was a frequent theme. For instance, one teacher talked about mutual ownership of learning, "It's not just my classroom... I teacher and you students, it was what we created together."

Another referred to her previous role as "*boss-lady*" and her re-definition of her role. She said she had shifted her language from "*you and me*" to "*we and us*". A third claimed, "*I didn't expect this but it's actually a de-formalisation of the student-teacher relationship, which was a bit of a challenge at times.*"

Through these examples, some of the potential of Pasifika concepts such as *va* to disturb business-as-usual in schools can be seen. This is perhaps especially true when teachers learn about teaching from students and their communities, and understand what is culturally expected of a teacher. It seems that when palangi teachers start shifting the lens through which they understand Pasifika educational relationships, there is a great deal of potential for change in the way that Pasifika education is understood.

Conclusion

I wanted to answer a question which concerned what teachers need to know in order to better support Pasifika students. I learned that the question should also include the issue of what Palangi teachers need to learn about themselves. The research suggests such learning can be achieved through disturbance (Peck, Gallucci, Sloan, & Lippincott, 2009) created by concepts which are culturally relevant but have origins which are not a teacher's own. It can be argued that the video mihi method as described above is worthwhile, but lacks the level of challenge to business-as-usual which is needed in Pasifika education. Pasifika education needs to involve relationships with Pasifika students understood by reference to Pacific concepts. *Va* is one such concept.

This research suggests the value and limitations of listening to Pasifika student voice which describes students. This is learning *about* Pasifika students. It advocates for the value of student voice talking about teachers and teaching. Understanding this requires learning *from* the Pasifika community through Pasifika concepts. If it involves this kind of learning, using mediated dialogue that develops reflective self-knowledge in Palangi teachers has transformative potential. Getting to know your students is all well and good, but seeing yourself as they see you is where the gold is.

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Acknowledgement

I owe a debt of gratitude to my supervision team of Dr Cherie Chu and Dr Mark Sheehan who have supported this paper. In addition, I acknowledge the community of Va'aomanū Pasifika at Victoria University of Wellington who have supported me. The first part of this paper was work shopped at a seminar under the auspices of Va'aomanū Pasifika. Particular thanks go to Dr Tamasailau Suaalii-Sauni for the help in my developing understanding of va.

Indigenous Skills in the Home Economics Curriculum at Solomon Islands National University: A Needs Analysis

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Abstract

The current Home Economics curriculum at Solomon Islands National University (SINU) is transmitting skills for employment and further education, but not adequately preparing student teachers of Home Economics to work in the different social settings in Solomon Islands. It would seem that, as a result, many SINU-trained Home Economics teachers lack confidence to survive in different social settings within Solomon Islands. Many seem disinterested in teaching in village community high schools.

As a Home Economics educator with six years of teaching the SINU Home Economics curriculum, I observe the absence of indigenous skills especially in the Clothing and Textiles, and Food and Nutrition units. From this observation, it would seem that the curriculum is responding to human resource development needs targeting employment rather than the needs of the educators. It is argued that integrating relevant indigenous Solomon Islands content into the Home Economics curriculum is likely to enhance teacher readiness and practice for working in different Solomon Islands settings.

The paper is based on a needs analysis survey which was undertaken with year 2 Home Economics students at SINU. Specifically, the survey sought the opinions of students on the types of indigenous skills needed to be included in Clothing and Textiles, and Food and Nutrition units; the relevance of the skills identified to their work as Home Economics teachers, and other educational issues necessary for teaching in different Solomon Islands settings. Findings of this paper are shared as a basis for discussions on the Home Economics curriculum as part of the review of this SINU programme.

Keywords: indigenous skills, Home Economics, teacher trainees, Solomon Islands

Introduction

I thank the organisers of the Vaka Pasifiki Conference for having this event held in Solomon Islands. This has allowed the opportunity for this paper to revisit the need to indigenise the Home Economics curriculum at Solomon Islands National University (SINU) as way of providing holistic teacher training.

The School of Education, SINU traces its roots back to the Solomon Islands Teachers College in 1975, one of the four government training institution that amalgamated in 1984 to form the Solomon Islands College of Higher Education (SICHE) (Solomon Islands College of Higher Education Handbook, 1992). Following the Act of Parliament for the Establishment of a National University in 2009, the Solomon Islands College of Higher Education attained University status in 2013 and became the Solomon Islands National University.

As in many Pacific Island countries (PICs), formal education in Solomon Islands was introduced by missionaries from the European countries, and later the aim of formal education was extended and strengthened by the colonial administrators. As Professor Konai

Helu Thaman pointed out at a Conference in Tokyo (Thaman, 2008), at the close of the 21st Century, international education agendas and goals influenced, and will continue to influence, the education system in Solomon Islands and the rest of the Pacific Island countries.

At post-independence, the colonial legacy continues to be evident in the curriculum of many PICs including Solomon Islands – in the curriculum of early childhood education (ECE) through to higher education; in particular, their content, pedagogy, and assessment. Thaman (2003) describes the curriculums of PICs, which are influenced by colonial philosophies, as “*culturally undemocratic*” because they neglect the cultures from which young Pacific people have been socialized and, thus, alienate them from their cultures.

My observations – based on personal experiences as a high school teacher, parent and teacher educator – are that the consequences of young people being alienated from their village setting and being educated in European values and knowledge system becomes increasingly problematic as young people get higher in the education system. Even after completing high school education, many find it difficult to re-adjust to village settings. Many of the high school push-outs flooded back to urban areas with the false hope of getting employment at the end of schooling because their inability to survive in the village has forced them to leave the villages. This is also true of Home Economics teachers graduating from SINU. Many of the graduates expressed a lack of desire to live and work in the rural social settings in Solomon Islands. Some of the reasons these teachers expressed were related to their inability to adapt to rural settings, remoteness, and schools lacking resources and facilities to implement the Home Economics curriculum.

In light of Home Economics teachers’ attitudes towards postings, Maslow’s theory of motivation was examined and it seems to suggest that teachers will always question their ability to cope because survival is a primary need (Huit, 2007). The training institution’s role in meeting students’ training needs was questioned in light of Thaman’s statement, “Young people in the Pacific Island countries are being deprived of much of the traditional knowledge, skills and values that could make them more effective citizens and members of their communities (2013).

As a lecturer of Home Economics at SINU, I was interested in further examining the factors contributing to this issue.

Teacher Training

According to Nabobo-Baba (2012), many reforms in the Pacific have failed to consider teachers’ and teacher education issues. Thaman (2008) notes that the role of teachers in PICs has not been seen as central to international debates and discussion about education despite the 1966 Geneva Recommendation Concerning the Status of Teachers. These statements are true in Solomon Islands where research carried out especially to identify issues related to teachers and teacher education is lacking. Teachers continue to have issues that are never given appropriate attention, and this affects the quality of education in Solomon Islands. Furthermore, changes in education in Solomon Islands fail to take a balanced approach. For example, as the result of the curriculum reform, the content of the National Home Economics Curriculum includes cultural knowledge and skills, but teachers are not trained to implement this content.

With reference to the training teachers receive, Thaman (2013) mentions that teachers in the Pacific were found to be underprepared to bridge cultural gaps and, in many cases, teachers as national school leaders are not culturally informed or are culturally unaware themselves. Thaman (2008) further mentions that what the training teachers go through in the PICs prepares them to be part of the intellectual elite whose knowledge, skills, and attitudes set them apart from the rest of the society and the socializing cultures they once grew up in.

According to Thaman (2013), the extent to which the school represents the cultures of Pacific Island Communities continues to be minimal as the officially sanctioned values are those of the school structure and the approved curriculum.

Thaman (2008), UNESCO's Chair for Pacific Education and Culture, states that UNESCO had supported PICs to advocate for Pacific cultural survival, and that the continuation of cultural diversity and education was one of the important struggles for Pacific Islands Countries. This means that the current focus of much educational debate and dialogue on schools, and the role of teachers in particular, is a welcome sign to those who have been working towards ensuring cultural sensitivity and inclusiveness among the Pacific teaching forces.

Education Initiatives

As noted by Thaman (2013), the 1996 Delors Report, "Education for the Twenty First Century, Learning the Treasure within" did help shift global attention to teachers and teaching. The authors assert that countries that wish to improve the quality of education must first improve the recruitment, training, social status, and working conditions of their teachers and encourage teacher participation in policy decision-making. The Delors Report pointed out that teachers are important individuals in the provision of quality education, and that their issues must be addressed and their involvement in policy making and curriculum development must be promoted (Thaman, 2013).

In 1992, a sub-regional seminar held in Rarotonga, Cook Islands, re-affirmed the need for ownership of school education by Pacific people if improvements in student learning outcomes were going to occur, and noted the vital contribution of teachers in the process (Nabobo-Baba, 2012). In the same year, the Pacific Association of Teacher Educators (PATE) was formed at the regional consultation held at USP. Teacher educators from around the region resolved to re-examine their curriculum offerings with a view to making it more culturally inclusive for the students as well as for the teachers. The implementation of this resolution was strengthened by the establishment in 1997 of a UNESCO chair in teacher education and culture at the USP tasked with the advocacy, teaching, research, and publications devoted to teachers, teaching, and the central role that culture plays in education generally and in teacher education in particular (Thaman, 2008).

Thaman (2013) notes another initiative that targeted improving the quality of education in the Pacific. The Rethinking Pacific Education Initiative for Pacific People by Pacific People (RPEIPP) is a movement formed in 2001 in the Pacific island countries with a transformative agenda. It includes contextualising and infusing higher education offerings in various ways in order to develop graduates into people who have skills, knowledge, and values that enable them to excel globally but, more importantly, are capable of working among their own indigenous groups. Nabobo-Baba (2012) clearly explains that RPEIPP was born out of the need to ensure indigenous and Pacific people to take increased ownership of the process of

education, as well as to re-examine curriculum processes. These initiatives support the notion that curriculum of both teacher education and learners generally must be culturally inclusive and sensitive in order to provide quality learning.

Furthermore, the view of the chair in UNESCO in teacher Education and Culture in the Pacific at USP (Thaman, 2008), is that in this age of increasing globalization, it is culture that will provide a safety net for Pacific peoples as they try to adapt to global changes and effects of climate changes. For example, it may be argued that the people of Solomon Islands survived both the ethnic tension experiences in 1998-2003, and the effects of the tsunami in 2007 because they depended on indigenous skills and knowledge before external aid arrived. Such examples illustrate the importance on indigenizing the curriculum of teacher education and learners' curriculum in the Pacific.

Home Economics Curriculum at SINU

The best place to embed the important aspects of culture in education is the curriculum. The argument of this paper is that integrating indigenous skills and knowledge into the curriculum of higher education is a priority before dealing with the schools' curriculum. Despite many calls and initiatives regionally to address cultural gaps in education in PICS, Solomon Islands has not integrated indigenous skills, knowledge, and values into its teacher education curriculum.

Over the past two decades or so, an increasing number of Pacific educators and scholars have wondered about whether the Pacific school curriculum had potential for delivering learning that is transformative, and whether incorporating Pacific knowledge and values could touch young people in such a way as to transform their attitudes, values, and beliefs. Some have also questioned whether the school curriculum had seriously taken into consideration the cultural backgrounds of pupils, and how students feel about themselves and their achievements. Francis Bogutu asked the question, "*Education for What?*" (Solomon Islands Curriculum Handbook, 1984) when education failed to meet the learning needs of Solomon Islands citizens and parents' expectations for white collar jobs. In the 21st century, "Education for What" was revisited and re-examined by Pacific academics and became the theme of 2016 Vaka Pasifiki Conference.

Under the "Education for what? Revisited" theme, the case of the Home Economics curriculum at the Solomon Islands National University was re-examined and, based on personal experience as the lecturer of the course for six years, the curriculum is found to be lacking important indigenous skills and knowledge. It seems to focus on preparing teachers to meet the teacher professional standards, and the skills and knowledge taught are preparing teachers to live and work in urban settings and in schools that are well-resourced. The Clothing Laboratory and Food Laboratory are equipped with modern resources, and this provides a model that students are expected to adopt. However, in the field teachers become frustrated when the features of the model classroom are not available in the schools.

The need now is to provide quality education for all young Solomon Islanders and this is still a challenge. According to the Ministry of Education Annual Report 2007, many schools in the Solomon Islands are still filled with untrained and undertrained teachers (MEHRD, 2008). It is important that Solomon Islands must be able to distribute the qualified teachers in schools around the country and that teachers must be trained to become servant leaders taking on the model that missionaries have demonstrated to serve others. This is because we cannot

alter many of issues related to smallness and isolation (Nabobo-Baba, 2002), but rather teachers must be trained to adapt.

The position of this paper is that indigenous skills be integrated into the Home Economics curriculum at SINU as way of helping trainees to be able to teach the Home Economics curriculum using naturally available resources, and also as a way of preparing teachers to be able to live and work in many different social settings in Solomon Islands. Teacher training needs have never been considered in the teacher education curriculum and this is still an issue to address.

In order to go beyond personal opinion however, a research project was conducted to gain further perspectives on this issue. The aim of the research was to seek students' perspectives about the idea of integrating indigenous skills into the current Home Economics curriculum at the Solomon Islands National University. The focus of the research was on students' level of support towards the idea; on their ideas about skills that are relevant to Home Economics, and which skills would best prepare teachers to work and live in different social settings in Solomon Islands. Three research questions that guided the research were: 1) To what extent do year II Home Economics teachers need indigenous skills to be included in the Home Economics curriculum at SINU? 2) What specific indigenous skills would students of Home Economics wish to learn and be included in the current curriculum? 3) In what ways are indigenous skills relevant and important for preparing teachers to work in different social settings in Solomon Islands? The gathered data by a case study survey was conducted at the School of Education. A questionnaire was formulated, and was self-administered as a form of course evaluation. The data gathered were organised thematically and presented quantitatively. The participants were all 45 Home Economics pre-service diploma students in year II, representing the major cultural groups in Solomon Islands. This was the first time the student teachers had been asked to give their opinion on how best to design the curriculum to meet their training needs.

The findings of the research, then, were that there was 100% student support for the need for indigenous skills to be integrated into the current Home Economics curriculum.

Participants were also asked to identify skills that they felt to be most relevant to teaching Home Economics content and were important to them. Based on the findings, 78% were interested in learning weaving, 20% indicated a wish to learn indigenous dyeing methods, 2% wanted to learn knotting, 80% indigenous cooking methods, and 20% indigenous food preservation methods (see Appendix for detail).

Another question asked of students was in regards to what indigenous skills would be most relevant to them as teachers of Home Economics, and for preparing them to live and work in many social settings in Solomon Islands. The question required students to write down only one response in order to gather students' answers based on their values or priorities. The result was as follows: 64% stated that indigenous skills are relevant to survival, 18% stated that indigenous skills can be applied to address educational issues in the classroom and also outside, 9% highlighted that learning indigenous skills as part of their teacher education could be a way to preserve the indigenous skills that are almost forgotten, and 9% mentioned that learning indigenous skills would be an opportunity to learn and share different cultures' indigenous skills and would help them to appreciate other cultures.

Based on the findings gathered from the needs analysis survey, it seems that there is a great need and strong support for indigenous skills relevant to Home Economics to be integrated

into the Home Economics curriculum at SINU. This indicates that teaching and learning indigenous skills must not be left to chance, but formally integrated into the current Home Economics curriculum. However, integrating indigenous skills into the Home Economics curriculum at SINU could be a challenge due to the diversity of indigenous cultures in Solomon Islands, as pointed out by Nabobo-Baba (2012). However, one of the ways in which indigenous skills can be integrated in the SINU curriculum is by making it a research assignment in the very first module of the course. This could mean that in Clothing and Textiles, for instance, could be named Indigenous Fibres and Textiles. In this module, the students would be encouraged to research indigenous skills, share their findings, and to produce a written document in their own local vernacular about the materials, production, construction methods, uses, and storage information. The written information would be documented and kept as a record that can be used in the future.

Conclusion

The body of literature cited, as well as the students' responses in the survey, have indicated that there is a great need for the integration of indigenous skills and knowledge into the current Home Economics curriculum at SINU as a way of preparing teachers to implement the National Home Economics curriculum, and also as a way of enhancing teachers' readiness and preparedness to live and work in different social settings in Solomon Islands. The current curriculum was seen to be culturally undemocratic, ignoring the culture of the teacher trainees, thus contributing to students' lack of confidence to live in different settings.

Implications of the Initiative

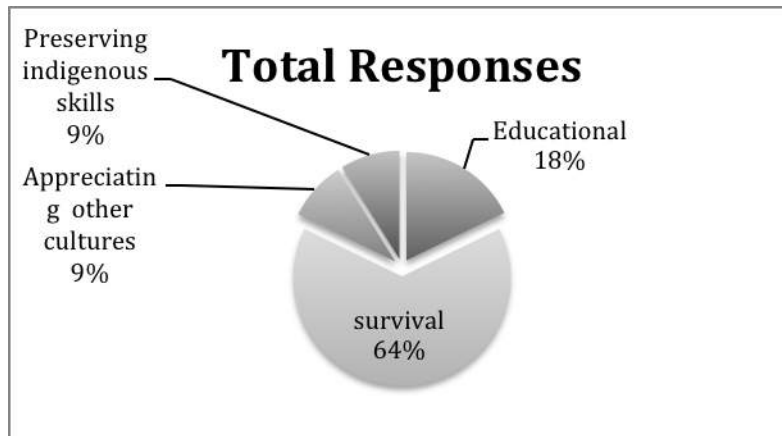
As a result of integrating indigenous skills into the Home Economics curriculum, the following consequences are anticipated:

- Students will be actively involved in researching indigenous skills and knowledge
- As part of the decolonization process in Higher Education, students can be introduced to various Pacific research frameworks such as Kakala (Thaman, 2008) and this could be a road map for Solomon Islands to develop its own indigenous research framework.
- Students will be more prepared to work in many different social settings in Solomon Islands.

Appendix

RESEARCH QUESTIONS	Responses	Percentage
QS1: To what extent do Home Economics Trainee teachers need indigenous skills to be part of the training curriculum at SINU?	45	100% (n=45)
QS2: What specific indigenous skills would students of Home Economics wish to learn and be included into the current curriculum?		
Weaving	35	78% (n=45)
Indigenous Dyeing	9	20% (n=45)
Knotting	1	2% (n= 45)
Indigenous Cooking Methods	36	80% (n=45)
Indigenous Food Preservation	9	20% (n=45)

Research Question 3: In what ways are indigenous skills relevant and important in preparing teachers to work in different social settings in Solomon Islands?



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Rethinking Diagnostic Assessments: An assessment framework for improving students learning and achievements in Solomon Islands.

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Abstract

There is a vital need for teachers to diagnose students' learning abilities, difficulties, and misconceptions so that teachers can develop and administer interventions in the science classroom. This is an alternative approach for improving students' learning and achievements in science education. This area has had little attention in Solomon Islands. Using a mixed mode qualitative-quantitative research approach, five secondary science teachers were interviewed and tasked to carry out a small scale longitudinal study with their own biological children attending secondary schools in Honiara, Solomon Islands. Qualitative and quantitative data were collected and analysed using cross-case and basic correlation analysis.

There were three themes that emerged from the data in the findings: lack of awareness and provisions to carry out diagnostic assessment in the science classroom, lack of teacher knowledge and competence on student diagnosis, and ability of teachers to plan, design, and implement quality diagnostic assessments and relevant remedial interventions. In addition, a significant gap in the understanding of diagnostic assessment as a pre-assessment tool and an interactive formative process were revealed. The significance of the research findings and challenges of the research are also discussed.

Introduction

The school curriculum and assessment system in the Solomon Islands have used the outcome-based education (OBE) model since 2005. OBE shifts from a "banking" system to a problem posing education (Daudau, 2010, 2012; Freire, 1973). A learner centred curriculum, assessment, and pedagogical framework were realised. As a result, a number of key education documents were developed and published. From 2011 to 2012, teacher in-service training was conducted throughout the country to familiarise teachers with the new curriculum materials. However, initial feedback from teachers raised the issue of teachers switching roles from classroom teaching to classroom assessors. The issue of automatic progression from one year level to another in the school system was also highlighted. Therefore, the need to identify students' learning needs in the classroom and develop strategies to assist students improve learning and achievements were contested. However, one option to solve challenges raised by teachers is to use diagnostic assessment as a pre-assessment tool. Diagnostic assessment identifies students' learning abilities, difficulties, and misconceptions at an early stage so that appropriate remedial interventions can be designed and offered to underachieving students in the science classroom (Bell & Cowie, 2001). With teacher's assistance and moral support from student peers, parents, and the school administration, students learning and achievements can be improved. Hence further investigation and research to enhance better understanding of diagnostic assessments, effective designing and application, and remedial interventions were recommended for the country.

Research Methodology

Qualitative data was collected using in depth interviews. In this approach, semi-structured questions are developed for face to face in depth interview. Focus group discussions were also conducted. During the focus group discussions, participants were given the opportunity to discuss and reflect on their observations both inside and outside of the classroom (Kitzinger, 1995 and Kumar, 2014). The study also involved parents who are teachers as professionals and their children as students attending selected schools in Honiara, Solomon Islands. Quantitative data was collected using an impact study over a period of three months. In this approach, pre-training session was conducted for participants prior to conducting the study. The impact study was used to allow the researcher to collect data on impacts of diagnostic assessment and remedial interventions, and to measure correlations with improvements with their students. The study also allow the researcher to collect data on teachers' feedback on their subject knowledge, teaching qualification and experiences, confidence, competency and assessment practices in the classroom (Kumar, 2014). Finally a reflective journal booklet was issued to research participants at the beginning of the longitudinal study. The purpose of the journal booklet is to allow participants to make observations when applying the student diagnosis and intervention framework. Participants also record and make notes on any progress and improvements that are significant during the longitudinal study.

Data Analysis

I chose to use the cross case analysis approach (Khan & Van Wynsberghe, 2008). Qualitative data from unstructured in depth face to face interview, focus discussion groups and recorded observations from a reflective journal will be analysed using the cross case analysis and longitudinal study, which were analysed using statistical analysis (Kumar, 2014). In such analysis, data collected from each school was treated as individual cases for comparison and contrast between different cases. In doing so, the researcher can explain why each case is different, and describe the relationship between cases and expand into descriptive data. The quantitative data from the small scale longitudinal study was analysed using simple statistical analysis. The analysed data was presented in tables and a bar graph.

Results

Generally, the results from the face-to-face interviews confirmed that science teachers were able to conduct some diagnostic assessment with remedial interventions, but were unsure of its application in the classroom. The study found that three out of the five teachers had implemented diagnostic assessments with remedial interventions, but were unsure of applications in the science classroom. The other two reported that they did not conduct or offer diagnostic assessments and remedial interventions. Therefore, students' learning abilities, difficulties, and misconceptions in the science classroom had not been properly diagnosed and acknowledged.

The quantitative results for the longitudinal study are shown below (see Tables 1, 2, and 3; Figure 1)

Table 1: Results of improvements at different year levels and secondary schools

Student	Sex	Diagnostic Assessment Level/Year	Baseline Data 2013	Cognitive Domain (k/u)		Psychomotor Domain (s)		Affective Domain (a/v)		Rate improved in learning and achievement
				Level	Grade	Level	Grade	Level	Grade	
1	M	Year 9/2013	Medium Grade at B level	4	B	5	A	5	A	High with steady improvement Grades: B, A, A
2	F	Year 8/2013	Low Grade at C level	3	C	4	B	4	B	Medium, Improved Grades: C, B, B
3	M	Year 7/2013	Medium Grade at B level	3	C	4	B	5	A	High with progress improvement Grades: C, B, A
4	F	Year 8/2013	Low Grade at C level	3	C	4	B	3	C	Low & steady improvement Grades: C, B, C
5	M	Year 7/2013	Low Grade at C level	3	C	3	C	4	B	Medium & progress improvement Grades: C, C, B

Table 1 shows the baseline data and student results after application of remedial interventions was completed. Table 2 shows the overall academic achievement of students after the remedial interventions were conducted and their current status in 2016.

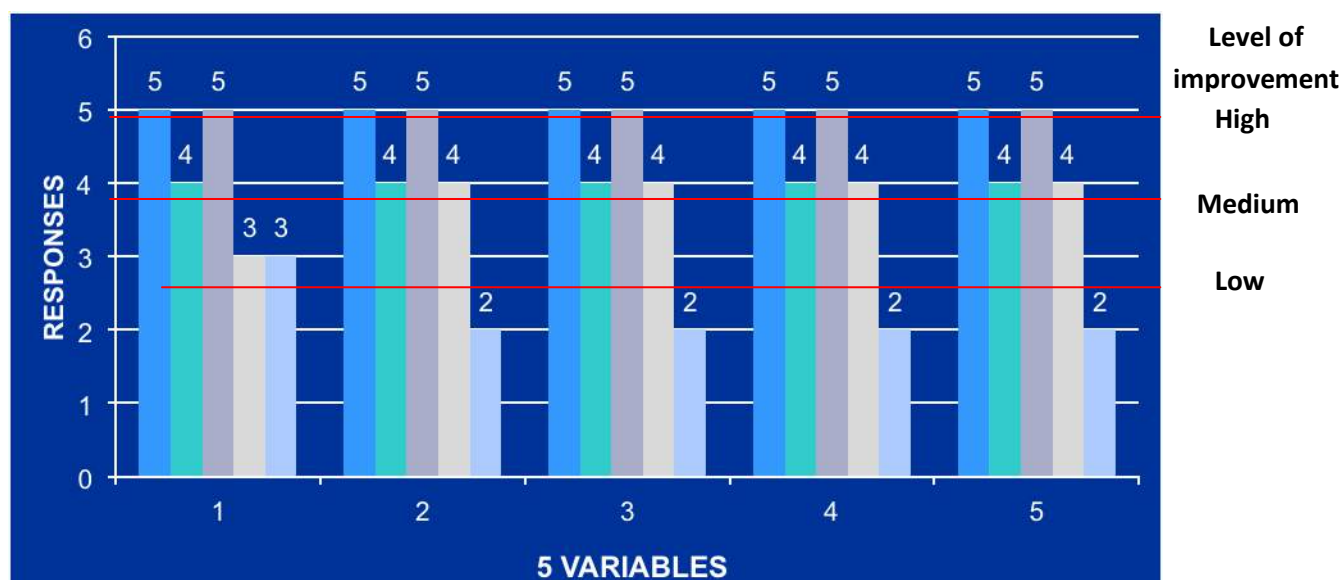
Table 2: Results of improvement in students' academic achievement in 2016

Student	2016	Improvement in students' academic achievement
1	Year 12	Placed into Year 10 of National Secondary School (NSS) from Community High School (CHS) Evidence of improved learning with high academic achievement
2	Year 11	Placed into Year 10 of the same NSS Evidence of improved learning with academic achievement
3	Year 10	Placed into Year 10 of NSS from Senior or Provincial High School (PSS) Evidence of improved learning with medium academic achievement
4	Year 11	Placed into Year 10 of same Senior or PSS Evidence of improved learning with low academic achievement
5	Year 10	Placed into Year 10 of same CHS Evidence of improved learning with low academic achievement

Table 3: Variables tested with teachers in the study

No	Variables	Teacher 1 Dark Blue	Teacher 2 Green	Teacher 3 Purple	Teacher 4 Brown	Teacher 5 Light Blue
1	Teacher subject qualification	5	5	5	5	5
2	Teacher training qualification	5	4	5	4	4
3	Teacher teaching experience	5	4	5	4	5
4	Teacher confidence and competence	5	4	5	4	4
5	Teacher assessment experience	5	4	5	4	2

Figure 1: Individual teachers' rating for each of the 5 variables



Analysis and Discussions

Conceptualisation of diagnostic assessment

Diagnostic assessment was conceptualised by science teachers as part of the interactive formative assessment process. It was also viewed by research participants as a pre-assessment tool or catalyst used to measure students' prior knowledge and current learning abilities, difficulties, and misconceptions. It was understood that such a process is seen as cyclic and on-going, and must be enhanced and monitored for improving students learning and achievements in the science classroom. It provides baseline information for understanding how much learning has taken place after a learning activity has been completed. This is useful information for teachers so that effective remedial interventions can be designed and offered to underachieving or at risk students. Teachers also understood that through diagnostic assessments, teachers are able to identify barriers in students' learning and achievements.

The study also reveals that there was no awareness or provision for teachers to plan, design, and implement diagnostic assessments and offer remedial interventions. There was no policy for application of diagnostic assessments and interventions in the classrooms. It was found that teachers do not have the required knowledge, understanding, and competence to design and implement diagnostic assessment and remedial interventions. The lack of strategic knowledge on diagnostic and formative assessment has not motivated science teachers to take such initiative in the science classroom. There was also gap in teachers' lack of strategic knowledge on assessment as a process-oriented framework and developmental learning continuum philosophy. The participants also confirmed that teacher beliefs towards students can also affect their learning and achievements in the classroom. Likewise, student's attitude towards their teachers can hamper students learning of science. Teachers were also of the view that there was a mismatch between the teaching and learning of science in the classroom, and assessments administered with students in schools as well as national summative examinations in the country.

Teachers' pre-requisite knowledge, competence, and practice

The longitudinal study has shown that science teachers must acquire sufficient knowledge and skills (pre-requisite knowledge) for design and application of diagnostic assessment and of remedial interventions and enrichment support. It was evident that effective designing of quality diagnostic assessment and application of remedial interventions requires qualified and experienced teachers with subject content knowledge, appropriate teacher qualification, assessment experience, and confidence and competence.

The study also showed that the differences in the variables identified in the study correlated with the degree of improvement in learning and achievement. For instance, the science teacher with a post-graduate qualification, a teaching certificate, and some years teaching experience, including experience with assessment work activities (exam setting, moderator, and marking), recorded significant results. In contrast, the untrained teacher with no qualifications and less teaching and assessment experiences got the least result.

Diagnostic assessment as interactive formative praxis

The assessment paradigms have its own merit for application in the classroom. The key role of assessment is to evaluate and monitor students' learning ability and enhance individual learner's growth and development. It will also evaluate teacher performance and improve teaching and learning practices, assist reporting and certification of students' performance and achievements in the schools (Brown, 2016). Thus, assessment can be seen as an interactive formative process underpinned by OBE model and curriculum framework developed and implemented in the country (Daudau, 2012).

The participants in the study defined diagnostic assessment as a process of interactive formative assessment. Such an assessment framework is used to measure students' learning abilities; and provide information about students' prior knowledge, experiences and current learning abilities, difficulties and misconceptions as well as baseline information data for understanding how much learning has taken place after a learning activity has been completed. Through diagnostic assessments, teachers were able to identify barriers to students' learning and achievements, as well as identifying why students went wrong in the assessment task. Thus, effective application of diagnostic assessments and relevant remedial

interventions will narrow the gap between low and higher achievers, and maximise overall achievements of students in the science classroom (Bell & Cowie, 2001).

Key Issues and Challenges

Lack of awareness and provisions for teachers to diagnose students learning abilities, difficulties and misconceptions in the science classroom is critical for understanding and application of the student diagnosis and intervention framework. However, the Ministry shall ensure appropriate policies are in place to guide the application of student diagnosis and intervention framework in the science classroom.

For effective administration of such policies, the Ministry would need to create provision in teacher establishment for two (2) deputy principals for secondary schools in the country. First deputy principal will be responsible for students' academic services, and second one for school operations and students disciplinary system. Furthermore, MEHRD should revive the concept of remedial teaching in the schools and the education system.

Teachers' lack of knowledge and competence on subject content, pedagogy and assessment practices will affect the teaching, learning and assessment of science. However, if teachers' continuous and ongoing professional development is conducted at the school level by the Ministry, SINU, and other teacher training providers, then teachers supportive role will be provided accordingly.

Lack of positive classroom culture in the schools will affect the teaching, learning and assessment of science. This is because classrooms are not well resourced with appropriate teaching and learning resources, tools and equipment, consumables and apparatus, learning facilities & infrastructures including a sound conducive learning space.

Self and Peer Assessment & Evaluation is a challenge for science teachers to involve students to realistically evaluate their own work and work of other peer students in the same classroom. Teachers and students would not have the time to plan, implement and evaluate assessment tasks. Despite the idea of co-assessors and investigators, there would be a lot of demand on teachers work to plan and organize student's assessment tasks, while supervising self and peer assessment and evaluation amongst students in the science classroom.

Teacher beliefs towards at-risk students and student attitude towards their teachers has been a challenge in the science classroom. This is a naturally bound phenomenon that depends entirely on the behaviour, beliefs and attitudes of the science teacher, and students and their cultural, church and other social backgrounds.

Conclusion

There are considerable challenges in our education system. Parents are blaming the teachers for not diagnosing students and not applying interventions in the classroom. Consequently, students were continued to be denied from such remedial assistance and enrichment support, and, as such, has substantively increased the level of difficulties of underachieving students in the classroom.

One of the key findings of the study is the need for development of a Psychometric and Clinical framework for effective design and application of students' diagnostic assessments and interventions. Such framework will not only confirm the use of a multi-level assessment

system (Fasi, 2009; Muralidhar, 2009), but also provide strategic knowledge and skills for science teachers to gain confidence and competence in the science classroom. Furthermore, the study reveals that there is a need for the integration of our cultural values, norms and belief system into the science curriculum (Fua – Johansson, 2009), and the teaching, learning and assessment practices (Fasi, 2009; Muralidhar, 2009). It was timely that learner-centred pedagogy are applied in the classroom (Koya, 2009; Manu'atu, 2009). According to the study, such a methodological approach must be implemented through social interaction. The use of culturally and responsive frameworks in the classroom is relevant to students learning contexts and whatever models used must anchor in our cultures to meet diverse learning needs in the classroom (Sanga, 2009).

The study has also noted the need for creating sound relationships between teachers and students, parental and school support. The creation of such partnerships in the school and stakeholders as a learning community is paramount. Therefore, the application of Psychometric and Clinical framework by science teachers in the classrooms will assist teachers in identifying students' learning abilities and potential areas at an early stage. Such information and data can be useful for student remediation, enrichment and determination of their future careers in the education system in the country.

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In-Service Primary Teachers' Attitudes and Beliefs in Science, Teaching, and Learning, and the Confidence to Teach Primary Science in Solomon Islands

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Abstract

Recently in Solomon Islands, a new primary science curriculum was introduced and primary schools around the country are expected to implement it. Primary teachers, teaching at years 1 to 6 throughout the country, took on the task to implement the new science curriculum. To assist these teachers, a primary science syllabus and different year level learner and teacher resource books were produced. This paper explores the in-service teacher trainees' attitudes and beliefs toward science, teaching, and learning, and their own level of confidence to teach the new primary science curriculum. Completed questionnaires were received from 119 of the 145 primary in-service teacher trainees that were enrolled in SC124, a science method course offered in the diploma of teaching primary programme (in-service) at the school of Education and Humanities (SOEH) of Solomon Islands National University (SINU). Data collected from questionnaires were analysed. The results indicate that, while in-service primary teachers have positive attitudes and beliefs towards science, learning, and teaching, they rated themselves as less confident to teach certain science topics in the new primary science curriculum. The in-service primary teacher trainees also indicated that they need further training in science content and pedagogy in order to build confidence to implement the new primary science curriculum. Implications of the results for preparing pre-service and in-service primary teachers are discussed.

Keywords: Solomon Islands, Attitudes, Beliefs, Curriculum, and Pedagogy.

Introduction

This paper was prepared for a conference with the theme: "Education for what? Revisited".

One way to discuss education for what, is to look at education as a means to prepare future workers to be more skilled, more efficient, better equipped to contribute to a growing economy, or to socialise future citizens. We also may see education as more about ensuring that all children, particularly in the poor communities around the world attend school with better-trained teachers, or about opening up peoples' creative potential throughout their lives so that they become more responsible citizens. Education can be also seen as one of the core pathways to human sustainable development. Teacher preparation is a vital step to achieving all these goals. In the context of science education, we may rephrase the theme as "what is the purpose of science education" or simply ask the question, "Why do we teach and learn science in primary and secondary schools in Solomon Islands?" This paper discusses findings of a study on in-service primary teachers' attitudes and beliefs towards science, teaching, and learning, and their confidence to teach primary science in Solomon Islands.

Science Education in the Solomon Islands

Science education internationally has been changing in the last few decades. These changes are mainly due to the needs and expectations of the modern society. Tytler (2007) discusses a re-visioning science education so that there is a move from creating scientists – "recruitment of a scientific elite and the exclusive focus on canonical science as mental training" (p. 17) –

to a more humanistic approach that engages children and caters to their abilities and interests. Smith and Gunstone (2009) offer the notion of “meaningful learning” for all students and citizens, not just for those intending to pursue science as a career; emphasizing that “the intellectual and moral growth of students is seen as an inextricable aspect of their development into citizens of a participatory democracy” (p. 4). This reflects the idea that science education today tries to make science relevant to students' lives, and there are plenty of opportunities where citizens can use their knowledge about science even if they are not professional scientists. Thus, one of the key goals for science education became the development of scientific literacy, which includes an understanding of the Nature of Science (NOS), something Tytler (2007) considers as the “epistemic basis of science”. Abd-El-Khalick and Lederman (2000) have also suggested that NOS is a vital component of scientific literacy.

Primary science education in Solomon Islands began in 1984 with the development of the Science and Agriculture syllabus. It was focussed on scientific knowledge of plants, animals, earth and space, and physical and chemical science (Ministry of Education, 1984). In 1999, the focus began to shift from students acquiring scientific knowledge to acquiring scientific process skills and critical thinking, including conducting investigations, analysing data, making inferences, and using information in ways that could benefit them (MEHRD, 1999).

This shift in the science curriculum continued when the Solomon Islands' national curriculum was significantly restructured and reformed in response to the needs identified through the development of the Education Sector Investment and Reform Programme and Education Strategic Plans in 2004 (MEHRD, 2001, 2004a, 2004b, 2005, 2007), shifting from an objective-based towards an outcome-based approach. The rationale of this new focus was to improve quality education through developing a comprehensive curriculum for all learners so that they may acquire relevant knowledge, skills, attitudes, and values and this should be facilitated through learning and achievement of outcomes through a learner-centred approach which, in return, will improve quality (MEHRD, 2010). The new focus will enable students to acquire worthwhile knowledge, skills, behaviours, attitudes, and values that will allow them to contribute towards their well-being and survival (MEHRD, 2005, 2007, 2010, 2012).

Science teacher attitudes and beliefs

Globally, research suggests that pre-service teachers enter teacher education programmes with negative attitudes and anxiety with respect to science and science teaching (Bursal, 2008; Irez, 2006; Murphy & Beggs, 2005) that have been shaped by their prior experiences (Tosun, 2000). Models have emerged about the acquiring of beliefs and attitudes (Jones and Carter, 2007; Jones and Leagon, 2014), and their influence on practice (Jones & Carter, 2007; Muis, 2007). For example, what and how to teach controversial areas such as evolution, biotechnology, and environmental literacy (Berkman & Plutzer, 2011; Nehm, Kim, & Sheppard, 2009).

Science learning and teaching

Other studies have variously investigated students and learning, and teachers and teaching (De Jong, 2007); how students' pre-conceived ideas may affect their learning (Osborne and Freyberg, 1985) and are very resistant to change; how individuals construct their learning by applying prior understandings to new ideas (Leach and Scott, 2003; Scott, Asoko & Leach,

2007); and the influence of the environment on a child's development (Vygotsky, 1986) whereby social interactions mediate learning (Duit & Treagust, 1998; Lemke, 2001).

Science teachers and educators face many challenges due to changes in science, human societies, and science education (Treagust & Tsui, 2014). This includes increasing intellectual isolation of science from other subjects and challenges in accommodating a science education for citizenship whereby science teachers must develop scientific literacy in all students, while also catering for the minority who aspire to become scientists or to pursue science-related careers Gilbert (2010).

Tytler (2007) shows that inquiry-based teaching approaches and strategies are most useful in the teaching of science in schools. Inquiry-based learning is a student-centred approach; provides opportunities for students to explore and build new knowledge based on their previous knowledge with the support of teachers, technology, and peers. Learning is stimulated by inquiry since it begins and is driven by questions or problems; and the teacher's role becomes that of a facilitator (Treagust & Tsui, 2014).

Purpose of the study

This paper reports on a research survey undertaken to investigate the attitudes and beliefs of in-service primary teachers enrolled in a science methodology course of the one-year diploma teacher education programme. The objectives of the study were to explore two questions: 1) What are the in-service primary teachers' attitudes and beliefs towards science, teaching, and learning; and 2) How do they judge their own level of confidence to teach various sub-strands of the new primary science curriculum?

Since there is currently a dearth of information to support effective science teaching in the country, it is envisaged that such information will help to construct positive recommendations for suitable professional development training for both pre-service and in-service science teachers in the Solomon Islands.

Method

This study employed a survey method to collect the data.

Participants

Participants were a cohort of 119 experienced primary teachers who were enrolled in the in-service one-year diploma programme at the School of Education and Humanities (SOEH) of Solomon Islands National University (SINU) in 2014. To be eligible for this programme, teachers had to have completed a certificate in teaching primary, and to have taught for more than two years in any Solomon Islands primary schools. Teachers were selected from throughout the country, private and public schools, different education authorities, and provinces. Sixty-five were females of whom fourteen had taught up to ten years, and fifty-one had taught more than ten years. There were 54 male teachers of whom twelve had taught up to ten years and forty-two had taught more than ten years. The longest term of service was 19 years and the least 5 years.

Instrument

A three-part survey questionnaire was used. The first part was designed to gather demographic data. Part two was constructed under five themes, namely (1) attitudes towards science, (2) beliefs about nature of science, (3) beliefs about learning science, (4) beliefs about the teaching of science, and (5) confidence in the teaching of primary science that were formulated from the literature review (e.g. Appleton, 1995; Hattie, 2008; Jones & Carter, 2007; Rodie, 1997), according to the strands and sub-strands of the new science curriculum (MEHRD, 2011). A five-point Likert scale was employed for part two, and data collected were analysed quantitatively by showing frequency of responses to each item. The third part of the questionnaire requested the participants to rate themselves regarding strength in science and whether they wanted further training and in which areas.

Procedure

Questionnaires were issued to all of the 145 students enrolled in the science methodology course. Participants were clearly informed about the purpose of the survey; that it was not compulsory to take part; that those who did want to participate should complete and return their questionnaire within one to two weeks; and that their identities would be kept confidential.

Results

The tables below show the summaries of the participant responses (in percentages, rounded to whole numbers) to each statement: strongly disagree-disagree (SD-D), not sure (NS), and agree-strongly agree (A-SA). The responses for Theme 1, Attitudes towards Science, are shown in Table 1.

Table 1

Theme 1– Attitudes towards Science Statement		Responses (%)			
		N	SD-D	NS	A-SA
1	Science is fun	119	9	11	80
2	Science is interesting	119	-	2	98
3	Science is exciting	119	-	8	92
4	Science is enjoyable	119	2	6	92

The results show that teachers had positive attitudes towards science as a subject. The highest level of agreement was with the statement “Science is interesting” (98%), and the least with “Science is fun” (80%). Regarding Theme 2, Beliefs about the Nature of Science, (see Table 2), the highest level of agreement (98%) was with the statement “Science is a body of knowledge, laws and theories that explain the world around us” and the least (72%) with “We have our own indigenous science in Solomon Islands”.

Table 2

Theme 2 – Beliefs about the Nature of Science Statement		Responses (%)			
		N	SD-D	NS	A-SA
5	Science is about observation, prediction and experimentation related to our physical world	119	-	3	97
6	Science is a body of knowledge, laws and theories that explain the world around us	119	-	2	98
7	We have our own indigenous science in Solomon Islands	119	3	25	72

8	Our understanding of traditional ways of conservation is related to science	119	-	4	96
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Table 3 shows the responses for Theme 3, Beliefs about Learning of Science. Teachers had the highest agreement (98%) with the statement “Children learn science better when teacher gives feedback on their work during lessons”, and the least with “Children learn science better by relating new knowledge to prior knowledge”. For Theme 4, Beliefs about Science Teaching, the statement “To teach science effectively the teacher should use different teaching techniques or strategies” received most agreement (95%), with only 77% agreeing with “To teach science effectively teacher should use inquiry approaches” (see Table 4).

Table 3

Theme 3 – Beliefs about Learning of Science		Responses (%)			
Statement: Children learn science better		N	SD- D	NS	A- SA
9	by participating in activities that are perceived to be useful in real life and culturally relevant.	119	1	4	95
10	by active, constructive involvement in the science lessons	119	1	4	95
11	by relating new knowledge to prior knowledge	119	1	6	93
12	when teachers give feedback on their work during lessons	119	-	2	98

Table 4

Theme 4 – Beliefs about Science Teaching		Responses (%)			
Statement: To teach science effectively a teacher		N	SD - D	NS	A- SA
13	must use science equipment, chemicals and proper science classroom.	119	4	12	84
14	must be a science graduate.	119	11	11	78
15	should use different teaching techniques or strategies	119	1	6	93
16	should use an inquiry approach	119	4	19	77

Theme 5 consists of four sub-themes representing the four major strands of the primary science curriculum (see Tables 5a, 5b, 5c, and 5d). Each statement in each table represents a sub-strand in that strand. For example, Table 5a shows the responses to the four statements representing the sub-strands (animals, plants, environment, and interrelationships) for the strand, Life and Living. Teachers rated themselves as more confident in teaching topics in this strand, with 89% indicating confidence to teach topics in sub-strand plants, and 79% to teach topics in the sub-strand Interrelationships between plants, animals, and their surroundings.

Table 5a

Theme 5 – Confidence in teaching topics in primary science strand <i>Life and Living</i>		Responses (%)			
Statement: I feel very confident when teaching topics on		N	SD-D	NS	A- SA
17	animals	119	4	14	82
18	plants	119	3	8	89
19	environment	119	2	11	87
20	interrelationships between animals, plants and their environment	119	6	15	79

Teachers rated themselves as having low confidence in teaching topics in the strand, Energy and Change. Only between 57-62% of teachers felt confident to teach topics in sub-strands Energy, Sound, Heat, and Force and Magnets. Topic in sub-strands Light (47%) and Electricity (40%) received a low confidence rating for teachers (see Table 5b).

Table 5b

Theme 5 – Confidence in teaching topics in primary science strand <i>Energy and Change</i>		Responses (%)			
Statement: I feel very confident when teaching topics on		N	SD-D	NS	A-SA
21	energy	119	13	28	59
22	sound	119	14	24	62
23	electricity	119	13	47	40
24	heat	119	8	35	57
25	force and magnets	119	8	32	60
26	light	119	14	39	47

Teaching topics in the strand Natural and Processed Materials also receive low ratings. Only 30% of teachers felt confident to teach topics in the sub-strand Chemical Change, and 60% indicated confidence to teach topics in sub-strand Physical Change.

Table 5c

Theme 5 – Confidence in teaching topics in primary science strand <i>Natural and Processed Materials</i>		Responses (%)			
Statement: I feel very confident when teaching topics on		N	SD -D	NS	A- SA
27	materials	119	13	40	47
28	chemical changes	119	19	51	30
29	physical changes	119	8	32	60
30	solubility	119	14	39	47

Regarding the strand Earth and Beyond, between 51 and 62% of teachers felt confident to teach topics from the sub-strands, Sun & Moon, Earth’s Rotation and Revolution, Solar System, and Night and Day (see Table 5d).

Table 5d

Theme 5 – Confidence in teaching topics in primary science strand <i>Earth and Beyond</i>		Responses (%)			
Statement: I feel very confident when teaching topics on		N	SD-D	NS	A- SA
31	the Sun and Moon	119	8	36	56
32	Earth’s rotation and revolution	119	11	32	57
33	the solar system	119	9	40	51
34	Night and Day	119	7	31	62

Item 35 requested participants to rate their strength in science. 24% rated themselves as weak, 71% as good, and 5% as very good. With item 36 requesting their opinion on further development and training, 98% responded “yes”, and only 2% “no” and “not sure”. Item 37 asked participants about which training they would prefer, and 100% of responses indicated professional development or training in science content and pedagogy.

Discussion

In contrast to many of the studies cited above (Bursal, 2008; Hechter, 2011; Irez, 2006; Murphy & Beggs, 2005; Tosun, 2000), the results of this study indicate that, on the whole, in-service primary teachers have positive beliefs and attitudes towards science as a subject crucial to their teaching (Jones & Carter, 2007; Muis, 2007; Tsai, 2002). Although the teachers indicate that science is interesting, enjoyable and exciting, 23% of the teachers indicated that science is not fun.

Teachers' agreement with the statement "science is a body of knowledge, laws, and theories that explain the world around us" shows understanding of NOS. They agree less with the notions that "our understanding of traditional ways of conservation is related to science" and "we have our own indigenous science in Solomon Islands". This suggests that teachers still believe that science is a foreign concept and their cultures have nothing to do with science. This is no surprise. Lederman's (2007) study indicates that science teachers, regardless of the number of years of teaching experience (pre-service and in-service) and disciplines taught, do not possess an adequate understanding of NOS. Literature has shown that the teaching of NOS must be explicit and reflective for it to be effective (Abd-El-Khalick & Akerson, 2009; Backhus & Thompson, 2006). Teachers' understanding of how students learn, and teaching approaches that lead to effective learning are also important.

Data from this research shows that the in-service primary teachers have a good understanding that "children learn science better when the teacher gives feedback on their work during lessons" (Hattie, 2008). Teachers also support the notion that children learn science better by participating in activities that are perceived to be useful in real life and culturally relevant, and by being actively and constructively involved in the science lessons. However, results also indicate that, while the in-service teachers strongly agree that "using different teaching approaches and techniques would lead to teaching science effectively", they are less in agreement with the statement "to teach science effectively teacher should use inquiry approach" as promoted by Tytler (2007) and Hattie (2008).

Teachers did rate themselves as good or very good in science, but all of them have indicated their need for professional development or training in the areas of science content and pedagogy. The study also identified that more than 60% lack confidence in teaching topics in the areas of physics, chemistry, and earth science. This finding is consistent with studies done elsewhere (Appleton, 1995; Harlen & Holroyd, 1997; Murphy, Neil, and Beggs, 2007); indicating that overall confidence of primary teachers to teach science is low due to a range of factors, including knowledge of science and that some of the science content taught at primary school is too difficult for the teachers, let alone the students (Harlen, 1997). Furthermore, Appleton's (1995) study shows that learning how to teach science is also significant. Loughran (2007) explores the idea that to teach for understanding, teachers need to be learners themselves throughout their teaching careers.

Conclusion and recommendations

The evidence from this study clearly demonstrates that there is a need to substantially increase science professional development for primary teachers. The following recommendations are offered for consideration when developing pre-service or in-service teachers to teach science.

1. Science content be taught in a manner, which will give students a more positive self-image of themselves as teachers of science.

2. Teacher professional development for primary teachers be more effectively targeted at specific aspects of science teaching that are more challenging for them.
3. Development of pedagogical content knowledge (PCK) for specific primary science content be introduced in teacher education programmes.
4. Science teacher educators continue to investigate effective teaching practices to increase potential learning and reduce potential problems.

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Teaching Physical Education with Locally Available Materials

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Abstract

While Physical Education is a subject in the Solomon Islands curriculum, little equipment is supplied to schools for use in its delivery by teachers. The lack of appropriate equipment denies students the opportunity for effective learning. Having observed Physical Education teachers in school settings for a number of years, I have noted the range of teacher responses to their needs for appropriate equipment. Obviously, when teachers showed initiative to find alternative means of teaching, they seem more effective as Physical Education instructors.

In this paper, I advocate for the use of locally available materials as resources (equipment) for teaching Physical Education in Solomon Islands schools. Premised on my experience and observations as a Physical Education educator, I argue that physical education must be taught in a holistic teaching and learning school environment. In the context of Solomon Islands, this includes the physical and cultural settings wherein there are local materials that are available as alternative resource for use in the delivery of physical education in schools. Underpinning my paper are the questions: What materials are available locally for use in teaching Physical Education? Are these materials used? How are they used? I explore these questions with actual examples of locally available materials and how these can be used.

Keywords: physical education, teacher resources, curriculum, Solomon Islands,

Introduction

This paper is intended to remind all education authorities, school headmasters or head mistresses, and teachers of the shortcomings that Physical Education is experiencing at his present time. Teachers find it difficult to teach Physical Education because of various factors. One of these factors is the shortage or non-availability of sports equipment. There are a number of reasons for this lack of availability. In some cases, schools cannot afford to buy foreign-made sports equipment, and because of the remoteness of schools in most provinces, it takes a very long time before ordered equipment reaches the schools.

In response to the shortages or non-availability of sports equipment in schools for the delivery of Physical Education, the use of locally available materials in the ECE, primary, and secondary school curriculum must be considered, developed, adopted, integrated, and utilised.

Observation

Prior to the initiative (described below), two observations and one literature review were carried out to ascertain that the Physical Education was neglected in the school curriculum in schools throughout the country. The first one was carried out in 2007. Ninety-six teacher trainees were given a questionnaire, which they were instructed to fill out when they were doing their teaching experience in the nine provinces. One of the questions in the questionnaire was about how much physical education equipment the school had. Out of

the 96 responses received, 85% indicated that Physical Education was not taught in the school because they lacked proper sport and physical education equipment.

Similarly in 2012, another questionnaire was carried out in Bula, the capital town of Isabel Province during a Physical and Health Education workshop organised by Japan International Cooperation Agency (JICA), Solomons. As guest instructor, permission was authorised for the survey to be given to the 34 workshop participants. The same question about how much physical education and sport equipment was available at the participant's school was included. It was no surprise that the response to this particular question also indicated that physical education was not taught in their schools because of non-availability of equipment. The result showed 78% of the schools did not teach physical education because of lack of equipment.

In his research on the delivery of physical education in the schools in the Solomon Islands, Dorovolomo (2009) also highlighted the fact that physical education was poorly taught because schools indicated that they do not have the proper equipment.

Possible Solution

The results observed above have become a very serious concern, and the writer took the issue seriously and looked for ways to help address it. As the writer reflected and pondered upon ways to help teachers to find alternative equipment to teach physical education in schools, the idea of using local materials emerged and so the ECE Coconut Olympic Games was born. The focus then was on the coconut palm and how its parts could be used to make equipment for the games.

The Birth of the ECE Games

On May 4th 2012, the researcher and the first year diploma students in the Early Childhood Education programme of the School of Education, Solomon Islands College of Higher Education (SICHE) organised a sports event called the "Coconut Olympic Games".

The aim of the project was to show the students that, by utilising the potential of materials from the coconut tree, such an event can be organised without having to spend much on equipment. Eight games were organised: Coconut Shell, Kings Relay, Windmill Relay, Fill the Bucket, Rob the Nest, Shot Put, Discuss Throwing, and Tossing for Targets.

Out of the eight games, only one needed additional equipment in the form of buckets and, of course, cones had to be used as markers for boundaries or playing areas. All other equipment for the games was made from materials from the coconut tree.

Eight ECE schools were invited but only seven attended the games. The atmosphere was very exciting and the children had a wonderful day (see images below). The feedback received from the participating schools was very encouraging and positive. The majority of the ECE supervisors realised that these games are common and traditional in nature, and the equipment used was readily available and can be easily made.

This project has highlighted the potential for use of locally available materials and the important role they can play in the ECE, primary, and possibly secondary schools' Physical Education curriculum. It also demonstrates that, as well as having the potential to enhance

the delivery of physical education in schools, local materials are environmentally friendly, safe, sustainable, and cheap.

Integration and Infusion

It was heartening to see that many students in this project had their first experience of learning to weave and make equipment such as woven balls, fans, windmills, javelins, crowns and baskets from the coconut leaves. These are livelihood skills in the Solomon Islands context, and to witness the students sharing and learning these skills from each other was a bonus. This was one of the highlights of this project.

Coconut Olympic Games

Below are some photos from the 2012 and 2013 games featuring games and materials created and modified for the events.

Kings and Queens' Relay



The crown worn by this female athlete was woven from a very young coconut leaf

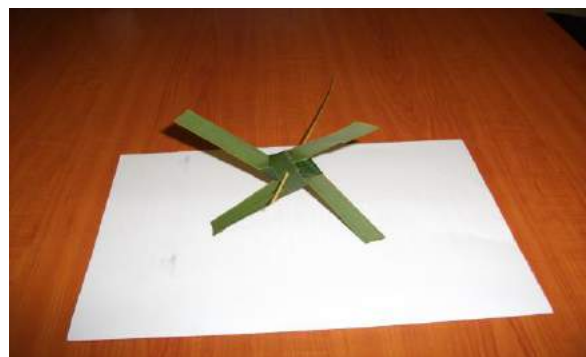


Picture of woven Crowns

Windmill Relay



The windmill held by the athletes during the race woven from a mature coconut leaf.



Picture of a woven Windmill

Javelin throwing



The javelins were woven from mature coconut leaves.



Picture of a woven javelin

Rob the nest



In the hoop are balls woven from the coconut leaves and some lawn tennis balls

Tossing for Target



In this game, a sago palm fruit is needed, a basket woven from the coconut leaves as shown in the picture

Shot Put



The young female athlete is throwing a shot put woven from coconut leaves

Fill the bucket



Each team has a coconut shell to fetch water from the bucket of water to fill their small bucket. The team that fills their bucket first wins the race.

Success

The ECE Coconut Olympic Games became an instant hit in many schools in around Honiara and were successfully organised again in 2013 and 2015. The number of participating schools increased from eight schools in 2012 to thirty five in 2015, and it is anticipated that 2016 will see another increase.

In 2012 and 2014 respectively, the idea was shared with ECE Teachers in Training from Choiseul and Temotu Provinces and it was very successful. The students realised the potential of the coconut tree and were able learn the games successfully.



Students from Choiseul participating in the windmill relay race.

What other local materials are available?

The coconut palm was chosen because of its very nature. It is easily accessible, available in all the islands in the country, safe, environmentally friendly, full of life, and cost little or nothing. However, in the games organised since the inception of the ECE Games, as well as the coconut tree, materials from the Sago Palm, and Yacuy have also been used. Furthermore, it has been discovered that parts of other local plants can also be used as equipment, or can be used to make equipment for the teaching of Physical Education lessons. These are namely, pawpaw, bamboo, cane, betelnut, calophyllum, banana, Barrington, and pandanus. Beyond this, it is likely that there are still more local materials out there in the environment that can be used in this way.

Recommendation

Most of the games created are fun and are easy to organise and it takes little effort to make the equipment if teachers can weave them with the coconut leaves. Otherwise there is the potential for integration and infusion of physical education with other subjects where teachers and students can learn to weave in an arts and craft lesson and then use the equipment made for their Physical Education lessons. These games can also be seen as alternative way to help to fight against non-communicable diseases. It is believed that when activities are interesting and easy to play, children are very keen to participate in them. When they are involved in regular physical activities, in the games mentioned above, their fitness level will increase, thus sustaining their health.

In light of all of this, education authorities, school principals, headmasters, headmistress, teachers, and other stakeholders are encouraged to realise the potential these local materials hold. Their effectiveness in the ECE Olympic Games was clear to see. Therefore, it is recommended that because these materials are at our doorstep, teachers take time to explore them and find ways to use them in Physical Education lessons and sports programmes. Physical education in Solomon Islands can be sustained with the use of these materials.

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A Pedagogical Shift in Primary Music Teacher Training Classroom: Solomon Islands National University

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Abstract

Little is written on Music Education in Solomon Islands. Little is known about the pedagogies employed by teachers. Yet, as a music teacher trainer with more than 10 years of experience, I have observed a significant shift in the music pedagogy of the primary programme. In 2007-2009, reviews at the (then) SICHE School of Education, in partnership with the University of Waikato, saw Solomon Islands indigenous pedagogies incorporated with conventional Western approaches. A creative process and a project-based curriculum were emphasised, reflecting indigenous ways of learning music and engaging trainees more fully and meaningfully.

Music training has since focused on voice – singing of chants, lullabies, traditional dancing songs – composing of ensembles, creating sound pieces, and the use of body percussion and constructed contemporary musical instruments from readily-available local materials and discarded junk as accompaniment. By comparison, the previous curriculum had emphasised the reading, reciting, and composing of musical scores using instruments such as keyboards, flutes, and guitars.

In this paper, I use my experience as a music educator to reflect on the following research questions: How effective has the modified approach to primary music classroom teaching and learning been? What have been the benefits or otherwise of the blending of the Solomon Islands indigenous pedagogies with Western conventional approaches? What have been the effects of utilising a creative process in primary teacher training music classrooms? To what extent is this approach relevant to equip and enhance Solomon Islands primary student teachers' musical knowledge and skills for classroom teaching and learning?

It is intended that this multi-themed reflective paper will begin to identify aspects of teaching and learning music that we need to “stop doing”, “keep doing” and “start doing.”

Keywords: music teacher training, pedagogy, Solomon Islands

Introduction

Solomon Islands Primary National Curriculum recently underwent a shift from objective based to outcome based. An Outcome Based Education (OBE) curriculum puts emphasis on learning by doing or by observing and experimenting. In this way, it relates to the traditional Solomon Islands way of learning by watching, working with, and being helped by adults and older people, rather than being taught theories in a classroom (Solomon Islands MEHRD, 2012). However, little is known about the pedagogies employed by music teachers and, furthermore, little is written on Music Education in Solomon Islands. In 2007 to 2009 the School of Education, Solomon Islands College of Higher Education (SICHE) underwent a curriculum review with the University of Waikato which saw local expertise working with their counterparts in developing the current music curriculum. This paper,

therefore, looks at the pedagogical shift in primary music teacher training in Solomon Islands National University (SINU).

Solomon Islands Curriculum

Solomon Islands National curriculum is Eurocentric in nature. Since the introduction of schooling by colonisers, including the missionaries' schools, curriculum continues to engage in and emphasise education that places emphasis on European (generally, Western) concerns, culture, and values at the expense of other cultures (Pop, n.d). Thus, many Pacific educational commentators (Nabobo, 2002; Sanga, 2002; Teaero, 2002a; Thaman, 1993, 2000, 2001, 2002) articulate that formal education or schooling and its curriculum is culturally and socially irrelevant to students and their communities. In addition, Pacific Island indigenous scholars (Thaman, 2002; Sanga, 2002; Teaero, 2002a; Tuinamuana, 2007; Taufe'ulungaki, 2002; Mel, 2002) all share the view that the culturally insensitive and undemocratic curriculum of Pacific Island countries' (PICs) schools is irrelevant and impede the effort of achieving quality education. In Solomon Islands, Maneipuri (2002) postulates that there is great need for cultural education to be incorporated in the schooling curriculum to promote inter-cultural tolerance. Malasa (1995) and Maneipuri (2002) comment that Solomon Islands curriculum is too Westernized or culturally irrelevant to produce citizens that fit back into their communities. Furthermore, such exclusive education is not learner-centred and does not cater for the learning needs of all children and youths at school, irrespective of ability, ethnicity, gender, religion, geographical location, or economic status (Puamau, 2007).

The view of many Pacific Islanders is well summarised by Thaman (1993, 2001), who argues that the curriculum of formal education in the Pacific focuses too much on economic development and, therefore, the whole social and cultural aspect of education has been de-emphasised or neglected. Thaman (2009a, p. 14) describes the curriculum as "largely Eurocentric in focus: donor/consultant driven, culturally undemocratic with little consideration of students' (and teachers') socio-cultural contexts, gender, and (dis) abilities, and almost nil stakeholder participation in their development".

Indigenous Knowledge and Pedagogy

"Pedagogy is a term widely used in educational writing but all too often its meaning is assumed to be self-evident" (Murphy, 1996, p. 28). This paper subscribes to the simple but meaningful definition that pedagogy is the practice that a teacher, together with a particular group of learners creates, enacts, and experiences (Leach and Moon, 1999, cited in Cogill, 2008).

The alternative non-Western curriculum that existed for generations in most indigenous Pacific Island states has been marginalised by our very own education system. As pointed out by Thaman (2002), Pacific societies had functional, meaningful, and relevant education systems before the introduction of schools. This education system is sometimes referred to as "Indigenous knowledge system", or "Traditional knowledge", or "Custom knowledge" – a way of knowing, which is referred to as indigenous pedagogy. Battiste (2002) says that indigenous knowledge is embodied in songs, ceremonies, and artworks; it is an adaptable and dynamic system. Yunkarpota, (2009) points out that indigenous pedagogy is experiential and that people learn by observing, listening, and participating with a minimum of intervention or instruction. Yunkarpota, (2009) concludes that Aboriginal

pedagogies of the indigenous Australians are flexibly planned, Values-based, Nature-centred, Communal Connected, Place-based, Holistic, Cooperative, Spontaneous, Inquiring, Reflective, Creative, Experiential, Problem-based, Imitative, Person-oriented, Auditory, Visual, Non-verbal, Imaginable, Kinesthetic, Trial and error, Repetitive, and Oral. These teaching and learning approaches are also found in Solomon Islands indigenous communities as Professor Peter Nines articulates in his research on indigenous learning of the Roviana people of the Western Solomons (Ninnes, 1991, 1995, 1996).

Reflection on Practices of the School Of Education and Humanities' Music Curriculum

The previous music curriculum was developed through consultation with Otago University, New Zealand in the late 1980's. Figures 1, 2 and 3 show examples of curriculum content extracted from the student workbook for first year primary music teacher trainees.

Figure 1: Example exercise on pitches

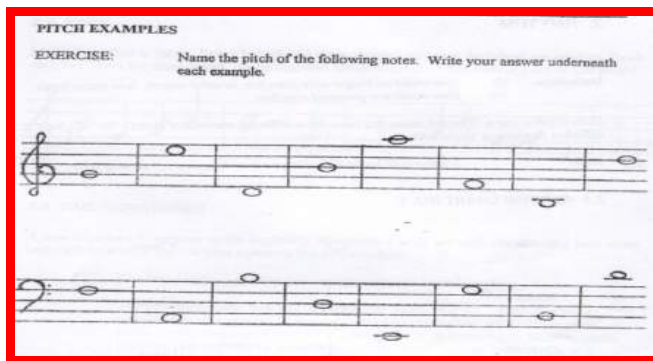


Figure 2: Example exercise on rhythms

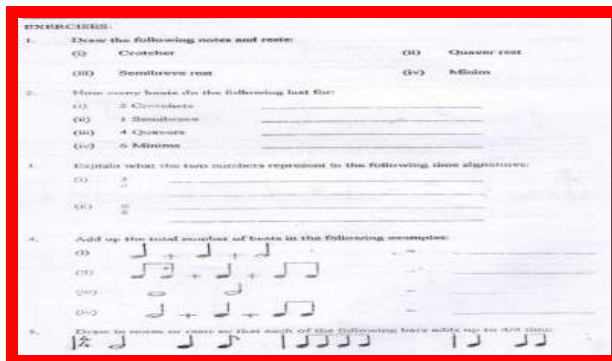


Figure 3: Example exercise on singing by sight reading



Figures 4, 5, and 6 are examples of common Western musical instruments used to teach music theory and skills.

Figure 4: Teacher Trainee playing keyboard as an accompaniment to his group musical sound piece



Figure 5: Solomon Islands primary student playing guitar



Figure 6: Recorder – Aero-phones



The current curriculum was developed through a partnership with Waikato University, New Zealand in 2007-2009. Figures 7 and 8 are examples of curriculum content of the current curriculum. The examples are extracted from the course reader and outline which is the introductory unit for music for first year primary teacher trainees.

Figure 7: Example from current curriculum: Assessment task and marking criteria

There will be one major assessment for this particular strand (Music). Students will go into groups of 10. Each group is expected to create sound piece/compose/rearrange known songs using their own creativity with natural sounds, manmade sounds and other musical instrument to accompany their songs etc. Each group is expected to produce a flow chart explaining what and how they create their sound piece/song.

Section.1. Group Performance						
Criteria	15	12	9	6	3	0
<i>Selection and combination of sound sources shows an awareness of the need to explore and experiment widely with sound.</i>						
<i>Group performance shows that the group has considered the use of musical elements and devices (eg. Structure, repetition & contrast etc.) In composing their sound-piece.</i>						
<i>Group performance demonstrates the development of playing and listening skills and of evidence of rehearsal in preparation for a skillful and expressive performance.</i>						

Section.2. Group learning story/Flow Chart						
A group record of our process	15	12	9	6	3	0
<i>Shows entries of students' discoveries and sound events made by collecting sound sources, playing around with sounds, changing sounds and selecting/rejecting sounds.</i>						
<i>Demonstrates clarity and depth of thinking when reflecting on the ways ideas in sound develop and become organized during the process of creating a sound-piece to perform to others.</i>						

Figure 8: Example from current curriculum: An Activity on Exploring sound qualities (tone colour) using the voice and other natural sound sources, rhythmically and expressively

Exploring sound activities in groups of 10. Body percussion sounds/mouth sounds led by one person and imitated by other members in turn around circle. Next person starts a new sound and so on. (*Shows imaginative ways of playing body sounds – techniques of playing are introduced and imitated by group*).

Table 1: Shows a comparison of the nature of the previous and current curriculums

Previous Music Curriculum	Current Music Curriculum
Developed by overseas expertise and adopted by SICHE.	Developed through partnership with overseas expertise and tailored to fit the local context
Focus on reading, reciting, and composing of musical scores	Uses Solomon Islands Indigenous chants, lullabies, traditional dancing songs to compose ensembles
Emphasised Western music theories	Creates sound pieces and use of body percussion and constructed contemporary musical instruments from readily available local materials and discarded junk as accompaniments.
Utilised Western conventional approaches such as lecturing	Emphasises creative processes and project-based curricula; reflects indigenous ways of learning music and engages trainees more fully and meaningfully.
Use of voice in singing Western school songs	Use of voice in singing of chants, lullabies, traditional dancing songs, composing of ensembles
Use of Western instruments	Uses body percussion and constructed contemporary

such as keyboards, flutes, and guitars to explore the basic music elements like pitch and rhythm	musical instruments from readily available local materials and discarded junk as accompaniments to explore the basic music elements such Pitch and Rhythm (see figures 9, 10, 11, 12,13, and 14)
Teacher-centred teaching and learning	Student-centred learning
Learning confined to the classroom	Learning also happens outside of the classroom and after official class times

Discussion

This section discusses the four research questions which were raised earlier in this paper.

How effective has the modified approach to primary music classroom teaching and learning been?

As highlighted earlier, partnership approach has given the opportunity for local expertise to genuinely participate in developing this curriculum. By this approach, indigenous music knowledge and pedagogies have been incorporated into the curriculum, thus making it more culturally democratic. It has contextualised the music curriculum which the teacher trainees enjoy and relate well to. This culturally relevant curriculum allows for trainees to use their indigenous music knowledge and pedagogies, or songs and chants, to create musical sound pieces that were never encouraged by the previous curriculum. Furthermore, it is effective because student teachers are genuinely engaged and grasp music concepts and skills more quickly by using their prior indigenous music knowledge. This has been encouraged through their musical project, which requires them to use their music knowledge, skills, and materials that are available to them in their context. For instance, they use their indigenous chants, lullabies, and traditional dancing songs to compose their music ensembles. Moreover, they use natural materials from the forest and sea and discarded junk from their environment to construct musical instruments to play along with their musical pieces (see Figures 9-14).

Figure 9: Indigenous musical instruments – Aero-phones



Figures 10 and 11: Indigenous musical instruments – Idiophones – Instruments that are struck/shake/hit



Figures 12, 13, and 14: Contemporary musical instruments made from junk



What have been the benefits of blending Solomon Islands indigenous pedagogies with Western conventional approaches?

One of the benefits of this modified approach is that it emphasises a more blended approach, which is the fusion of the Eurocentric and Solomon Islands indigenous knowledge and pedagogy. This has benefited indigenous music. For instance, the use of Western music notation has benefited indigenous music in terms of writing down the musical scores of the indigenous chants, lullabies, and songs for the purpose of recording them in writing to retain their rich melodies or tunes for future generations. In addition, the use of modern instruments like guitar and keyboard as accompaniment to traditional indigenous tunes and melodies gives more rich harmony and dynamics to these indigenous melodies and songs.

Another benefit of this modified approach is that it promotes indigenous musical knowledge and pedagogy in the formal setting of teacher training classrooms, and it is hoped that it will trickle down to primary music school classrooms. As Lawton (in Thaman, 1993) states, these learning experiences are so valuable that their survival must not be left to chance, but entrusted to teachers for expert transmission to young. This approach also promotes Solomon Islands indigenous culture through music teaching, and recognizes Solomon Islands indigenous knowledge and pedagogies through the institutionalisation of our ancient knowledge that has been marginalised by schooling since its introduction in the Islands.

Next, this modified approach contextualises the music curriculum; this makes the teaching and learning more meaningful to teacher trainees. For instance, the use of indigenous musical knowledge and pedagogies – chants, lullabies and traditional dance songs, which are from the context where they have socialised since birth – makes learning music more appropriate and

makes the teacher trainees relate well to music content taught. Furthermore, the construction and use of musical instruments found in their local natural environment reflects the kind of school environment that they will teach in once they graduate from Solomon Islands University. The contextualising of the music curriculum makes it more relevant to rural indigenous Solomon Islands primary school settings.

What have been the effects of employing a creative process in primary teacher training music classrooms?

This modified approach to music teacher training places emphasis on The Creative Processes. The Creative Process involves four phases – preparation, incubation, illumination, and verification – and the creative person/s must continually rethink, reconsider, replace, refine, redo, reaffirm, reprocess, rewrite, and reconceptualise until they get the correct process to produce the intended product (Balkin,1990). One of the effects of employing the creative process in primary teacher training music classrooms is that the student teachers learn the elements of music better. They are genuinely engaged in exploring the music through creative process where they experiment both spontaneously and deliberately when composing their group’s musical sound piece. They self-assess their choices by listening to, reflecting upon, and revising various musical arrangements and make adjustments accordingly.

A project-based approach is also used. The effect of this approach is that the students’ teacher trainees learn to work cooperatively with others in their groups. Individuals each have tasks to complete and contribute to the group’s musical sound piece. For example, individuals may contribute by creating short melodies and constructing instruments for their respective musical projects.

Another effect of this approach is that the creative process allows for the indigenous pedagogies to be employed in teaching and learning of the music content. For instance, the student teachers use a variety of indigenous ways of learning – experiential, imitative, auditory, imaginable, kinaesthetic, trial and error, repetitive, and oral – in composing their musical sound piece projects.

To what extent is this approach relevant to equip and enhance Solomon Islands primary student teachers’ musical knowledge and skills for classroom teaching and learning?

Firstly, this approach is relevant to equip and enhance Solomon Islands primary students’ teachers’ musical knowledge and skills for classroom teaching and learning because it places emphasis on their indigenous music; knowledge and pedagogies which these indigenous teacher trainees are socialised in and familiar with. Therefore, they grasp the musical concepts and skills better, respond quickly with fun, and show deeper understanding of the concepts and skills taught. For instance, they can spontaneously create short rhythms and melodies using on-the-spot materials such as tables, books, sticks, stones, and their bodies as accompanying percussion instruments.

Next, this approach reflects the ways indigenous Solomon Islands learn in their social settings, not the alien Western conventional way. This approach relates well to the realities of the Solomon Islands Primary schools settings.

Solomon Islands Primary Teachers are able to incorporate their indigenous music knowledge and pedagogies in the teaching of music curriculum in primary schools, using Solomon Islands indigenous music and constructing musical instruments from readily-available natural materials and junk (see appendices) of the settings of their schools.

Conclusion

While gaps remain in the area of Music Education in Solomon Islands, the pedagogical shift in primary music teacher training classroom at SINU re-orientes the teaching and learning of music in Solomon Islands primary classrooms. It is anticipated that this shift will contribute to the revitalisation of Solomon Islands indigenous music knowledge and pedagogies that have been marginalised since the introduction of formal schooling to our shores. This approach contextualises the teaching and learning of music, thus making the curriculum more relevant to indigenous Solomon Islands school children. By considering what we need to “stop doing”, “keep doing” and “start doing” in music education, this paper has addressed the question of “Education for What?”

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Students' Self-Efficacy Toward Learning Chemistry

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Abstract

This article discusses student self-efficacy toward learning Chemistry. Self-efficacy refers to one's beliefs about accomplishing a task and can influence choice of activities, effort, persistence, and achievement. From this study, it was highlighted that higher students' self-efficacy, necessitate learning of Chemistry with confidence. While the study finds a low level of students' self-efficacy toward Chemistry learning, it can be enhanced by doing more practical work. The study findings also will help teachers and educators to find ways to improve teaching and learning Chemistry contextually. By implementing changes that foster effective and worthwhile learning of Chemistry in context within the classroom, student sense of self-efficacy toward learning Chemistry will be enhanced. As students work on tasks, they acquire information about how well they are doing. This information influences their self-efficacy for continued learning and performance. It is essential that teachers of Chemistry communicate the Chemistry knowledge effectively and adapt to changes to the learning needs of students.

Key words: Self Efficacy, high school students, Chemistry learning, motivation

Introduction

This paper is focussed on Chemistry students in Solomon Islands secondary schools. It presents students' views on students' self-efficacy toward learning Chemistry.

Literature suggests that self-efficacy beliefs determine one's functioning as a human being in that people's levels of motivation, affective status, and actions are based more on what they believe than on what is objectively true (Aydin, Uzuntiryaki, Demirdogen, 2011). It can also be said that self-efficacy has a significant bearing on one's ability to acquire knowledge and utilise it effectively (Bandura, 1997; Aydin, et al., 2011). It is of interest to note that if one's level of self-efficacy can determine career path, then that selected career may in fact shape one's life choices based purely on one's level of perceived self-efficacy at a particular point in time. This implies that it is important that students are given the opportunities to develop their cognitive skills, in order to develop high levels of self-efficacy (Bandura, 1997; Bandura & Locke, 2003).

Statement of Issue

Over my sixteen years of teaching general science and Chemistry, I have had numerous encounters in which the capability of students to pursue further studies in Chemistry declines as they move through the formal education system. The ability to build a firm belief in students to overcome their fear of failing in studying Chemistry sparks an interest in me. According to the conviction that one can successfully execute the behaviour required to produce an outcome, self-efficacy is an important precondition for behavioural change, since it determines the initiation of coping behaviour (Bandura, 1997; Dalgety & Coll, 2004). Thus, it is of interest to pose questions to gather information about the nature of students' self-efficacy toward learning Chemistry.

Significance of Study

This research study is significant because the views and experiences of student participants can be compared to other related studies that have highlighted the significance of self-efficacy in determining active learning and enjoyment of Chemistry lessons. All students have the potential to learn, and it is important to provide a variety of learning experiences and an environment that promotes positive attitudes in classroom learning. It is widely agreed that students learn differently (Cook, 1997; Morrel & Lederman, 1998). The ability to know and identify student types can assist teachers in developing more relevant activities geared towards better acquisition of knowledge and thus increase learning.

Study Purpose and Objectives

The objectives of the study are:

1. To identify Year 10 students' perception of their self-efficacy toward learning Chemistry; and
2. To qualitatively investigate any association between students' self-efficacy and motivation toward learning Chemistry.

The following questions guided the study:

3. What are student self-efficacy beliefs toward learning Chemistry?
4. What association, if any, is there between student self-efficacy and motivation toward learning Chemistry?

It is hoped that the findings of this study can be used to make improvements towards rethinking, reordering, and implementing teaching and learning strategies to promote student self-efficacy toward learning Chemistry in secondary schools.

Methodology

A mixed-method research approach was used in the study. The quantitative component employed was a survey questionnaire comprising eight items designed to generate data about students' perceptions about their own self-efficacy. The self-completion questionnaire was administered in four different schools with eight Year 10 classes. The sample size was 258, and the students were between 14 and 15 years of age.

Qualitative data to determine links between motivation and self-efficacy were gathered from semi-structured focus group interviews. The quantitative survey data were analysed with qualitative data obtained by conducting a focus group interview with each of the eight classes surveyed. This was done to obtain an in-depth interpretation of patterns established from the quantitative data, allow for the exact voice of interviewees to be extracted, and to give the research greater reliability (Cohen et al., 2007; Gorard, 2004; Morgan, 2007; Onwuegbuzie & Leech, 2010).

Three basic data analysis techniques were used:

5. Cross tabulation of the quantitative survey data;

6. Analysis of Variance (ANOVA) to check the validity and reliability of the study results; and
7. Thematic analysis of focus group data (see Misitom, 2012).

Findings and Discussion

Self-efficacy and Chemistry

Research on student self-efficacy suggests that prior beliefs can change with new information presented within students' current beliefs, attitude, and experiences (Areepattamannil et al., 2011; Bandura & Locke, 2003; Bannier, 2010; Dalgety, 2003; Reid, 2007). The study findings here highlight that to change an individual's attitude, the teaching of Chemistry must be seen by students as worthwhile, and related to the individual's own beliefs and attitudes.

The major area of interest in this study is student self-efficacy toward learning Chemistry. Self-efficacy here is the conviction and belief that one can successfully execute the behaviour required to produce an outcome (Bandura, 1997; Gerhardt & Brown, 2006; Jinks & Morgan, 2001; Weihua & Williams, 2010). This research was directed specifically to Year 10 students and the quantitative data points to low self-efficacy toward learning Chemistry. Consistency in the quantitative and qualitative data indicates that there are factors that contribute to such observations. The first is the lack of a high level of self-belief. It is likely that this rests in the students' background and upbringing, which impacts on physical and emotional states. Most students in the Solomon Islands are not confident about speaking out and challenging their elders and the views of people in authority. The typical home environment in Solomon Islands is one in which children are reserved, told not to fully express themselves in front of their parents, with fear seen as a mark of respect. In such an environment students experience self-doubt and anxiety. This is consistent with literature which suggests that students' level of self-efficacy is linked to the degree of open communication with their parents, and elders (Caparara, Pastorelli, Regalia, Scabini, & Bandura, 2005; Reid, 2007). It is, therefore, understood that the higher students develop their self-efficacy at home, the more likely they are to develop a positive level of self-efficacy at school.

Secondly, experience of repeated failure in Chemistry tasks creates a lack of belief in oneself, causing students to avoid performing similar tasks. This finding is related to Bandura's performance attainment, which is interpreted as an authentic mastery experience of one's performance (Bandura, 1997, 2002). Thus, a strong efficacious belief is formed when a person experiences success, while repeated failures lower self-efficacy.

Thirdly, imitating and comparing student performance is seen as degrading a student's learning and thinking status. According to Bandura (1997), a student visualising and comparing themselves with other students' successful performance of a task can raise self-efficacy. While this type of comparison enables students to model their level of self-efficacy against their peers of similar academic level (Bandura, 1997, 2002), the findings in this study indicate great reluctance in students to do so, due to a combination of personal pride and respect for the high competency displayed by their peers.

Finally, there is very little verbal encouragement amongst the students and from their teachers. Verbal persuasion is believed to determine self-efficacy (Gerhardt & Brown,

2006). According to this study's findings, most teachers give praise only where praise is due. Added to this, the competitive nature of student peers causes students to be reserved, and not be vocal. In addition, participants' upbringing in terms of respect for the teacher (elders and those in authority) during class time has also shaped students to be introverted during lessons, directing their feelings and thoughts inwardly.

Self-efficacy and motivation

As previously described in this study in relation to motivation theory, goal setting and self-efficacy are influential on students' expectations and achievement (Jinks & Lorschach, 2003; Pajares, 2002; Reid, 2007; Tuan et al., 2005; Yusuf, 2011). The qualitative findings indicate that students' motivation has a direct influence on their self-efficacy toward learning Chemistry. Students who are intrinsically motivated to study Chemistry have acquired a sense of self-worth and confidence, setting goals that they can achieve and working towards achieving them. Such students are then performance-oriented. This study also found that intrinsically motivated students are more outspoken and expressed enjoyment and excitement about acquiring knowledge and the sense of accomplishment it brings. This is consistent with previous studies (e.g., Barrick, Mount, & Judge, 2001; Costa, McCrae, & Martin, 2008; Martin, 2003), which report that extroverts tend to be talkative and assertive, and demonstrate affects such as energy, zeal, and excitement. From this study, students with high self-efficacy toward learning Chemistry often confidently share their knowledge with others, as compared with those who have low self-efficacy.

The study also highlights that self-efficacy toward learning Chemistry can be enhanced by doing more practical work – consistent with other research findings (e.g., Manaf & Subramaniam, 2004; Staver, 2007; Sterling & Frazer, 2008; Yusuf, 2011). In addition, students have higher self-efficacy when the practical and investigative work is designed and carried out within the student context and environment (Brodie, 2006; Roscorla, 2009; Woodley, 2009; Yagenska, 2007; Zain et al., 2010). Such engagement builds student confidence, and aids the retention of knowledge and understanding of concepts in Chemistry. This, in turn, will build student self-efficacy toward learning Chemistry.

Implications of the findings

The findings of this study are likely to be of interest to teachers of Chemistry, curriculum developers, and teacher educators. There are a number of implications in the areas of student learning, teacher professional development, and classroom practice.

Developing students' self-efficacy

The study reveals that Solomon Islands students generally have low self-efficacy toward learning Chemistry. To address this issue, Chemistry students should be encouraged to make personal reflections on their self-efficacy towards learning Chemistry, make improvements where appropriate, and take necessary actions that foster effective and worthwhile learning of Chemistry. By doing so, students could use their school Chemistry knowledge to try and make sense of the natural world around them (the Pacific context). This can be done by ensuring that all students have personal journal entries on their self-efficacy in learning Chemistry each week. Students, then, are required to assess their own learning progress each week, submit a one page summary of their reflections to both the teacher and peers, and commit to improving their self-efficacy in learning Chemistry.

Teacher professional development

Teacher professional development on strategies to increase the level of student self-efficacy in learning Chemistry is recommended. For example, teachers could adopt contextual lesson planning focused on discovery and cooperative learning that promotes a positive learning environment for Chemistry within the Pacific context. This can be done by guiding students to develop their own contextual experimental designs for given Chemistry topics, with inquiry prompts guided by the teacher. Such flexibility and contextual focus would allow for the different learning needs of students, raise the worth of Chemistry, encouraging a sense of ownership and boosting self-efficacy toward learning.

Experiments and Chemistry learning

The research findings revealed students' desire for more experiments and practical work to be incorporated into Chemistry lessons. Teachers need to extend the learning environment beyond what is stipulated in the curriculum and its supporting resources. This can be done by contextualising adopted experiments to suit student contexts – the Pacific context. Doing experiments does not have to be in the classroom or science laboratory. This could be done by identifying student common life experiences (the Pacific context) that involve Chemistry principles and concepts (Bandura, 2002; Vedder-Weiss & Fortus, 2011). Such learning contexts and situations, when effectively planned and implemented, are conducive to learning, and would foster worthwhile learning of Chemistry. In this way, students may gain greater self-efficacy toward learning Chemistry.

Conclusion

The conviction and belief that one can successfully execute the behaviour required to produce an outcome, plays a vital role as far as students' learning of Chemistry is concerned. From this study, higher student self-efficacy is necessary for learning of Chemistry with confidence. While the study finds a low level of student self-efficacy toward Chemistry learning, it is also indicated that motivation leading to self-efficacy can be enhanced by doing more practical work. It is anticipated that the findings in this study will create interest into further research on student self-efficacy toward learning Chemistry. This research proved to be valuable, particularly because it is the first of its kind conducted within the context of Solomon Islands. It encourages teachers of Chemistry to reflect, and to take stock of their teaching. It is anticipated that the findings will help teachers and educators to find ways to improve teaching and learning Chemistry contextually. It is essential that teachers of Chemistry communicate the knowledge within the field effectively and adapt to changes to the learning needs of students. By implementing changes that foster effective and worthwhile learning of Chemistry in context within the classroom, student sense of self-efficacy toward learning Chemistry will be enhanced.

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Teachers' perceptions on identifying, understanding and providing assistance to enhance learners' science potentials/skills: A Solomon Islands Case study.

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Abstract

Every single human being has a unique character and abilities within the common human design. This uniqueness is evident by their fingerprints. That point itself speaks of the original, untapped potential that lies dormant in each individual person. Are current school curricula catering for the unfolding of these unique abilities? If yes, what are teachers' views on identifying and providing assistance in nurturing these unique qualities? And if not, why and what is the focus / direction for the future? Such important questions must not be left unasked. By posing them, the needed care for supporting uniqueness is demonstrated.

In this study, an investigation was made into the perceptions of Honiara-based educators about identifying, understanding and providing assistance in developing and enhancing learners' potential. Specifically, the investigation focused on learners' potential in General Science education. Two data gathering methods were used. First, a set of questionnaires was given to 18 teachers (6 ECE, 6 primary and 6 secondary) and three curriculum officers to respond to. Second, two focus group interviews; comprising of three people per group, were administered. Data obtained from sources were analysed thematically. Particular attention was given to teachers' perceptions about identifying, understanding and developing learners' potentials.

Findings obtained from the study are shared. Discussions on the findings are useful to assist policy makers and teachers in designing and implementing problem posing curricula, which can support the enhancement of the potential of learners. Wider useful discussions stemming from this study are likely to include learner success mentalities, acquisition of life skills, academic pools of specialists with the right people doing the right work, high yield products and production, and ways of strengthening, sustaining, and empowering a nation's development aspirations.

Keywords: uniqueness, design, teacher nurturing, Solomon Islands

Introduction

Over many years of research findings and discoveries, the uniqueness of the human fingerprint has been established. According to forensic science identification and classification, two scientific truths have emerged. First, fingerprint details are "immutable". The relationship of the ridge characteristics does not change from before birth until after death. Secondly, there are no "duplications within nature" for human beings, and each set of friction skin is unique to the individual on which it appears. Thus, every single human being is biologically different from the other.

Galton (1892) further proposed that the odds of two individual's finger prints being the same were 1 in 64 billion. On the other hand, the same paper also said that the fingerprint patterns of identical twins may be extremely similar, but the configuration and sequence of details are as individual and unique as those of any two unrelated beings. This finding

showed that the thumbprints of three triplets were totally different from each other (see Figure 1 below).

Figure 1: Thumbprints of identical triplets



This unique fingerprint idea has been serving governments worldwide for many years to provide accurate identification of criminals. However, alongside the security purpose, the unique package concept could also serve other unknown purposes which have yet to be found, including applications relating to learner uniqueness.

The mango seed analogy for learners

The analogy of a mango seed, which is produced from mango tree (fruit) can be used to explore the nature of learners. In that particular seed, the life of the next mango tree is contained. However, the mango seed will not display its full potential as a mango tree until it has germinated, been nurtured, and finally bears fruit with its own seeds. This is the entire purpose for producing fruit/seed; the continuity of life for the next mango tree and, further, to a mango tree plantation.

Following this analogy, buried within a person is the unique life, potential, and skill that no one else has. This is referring to a person's life with potential, dormant ability, and reserved power, untapped strength, unused success, hidden talents, and capped capacity. Also the skills could be referred to as the "adaptive skills", the ones that describes one's personality, traits, and characteristics. This uniqueness needs to be passed on to the next generation. However, this cannot be done if the unique abilities are not uncovered and developed to fulfil their purpose.

Figure 2: Mango seed Analogy



On that same note, different seeds have their own uniqueness within that common tree structure. Similarly, different people have different unique abilities within the general human structure. According to Warren (2002), every individual exists for a reason, assignment, and purpose; not by accident. Munroe (2012) states that every single being exists for a purpose as unique as their fingerprints. According to Myles, scientists in the field of human potential have estimated that we use as little as 10 percent of our abilities. Ninety percent of our capabilities lie dormant and wasted.

So the important question one could ask now is, how can these unique abilities be uncovered in the life of these different people? According to the seed analogy, seeds need favourable conditions involving water to catalyse their germination. In the absence of this condition, seeds will either take a long time to germinate or otherwise will dry up and fail to fulfil their intended purposes. However, the germination period can also vary across different seeds. For instance, there are seeds which, even though they are provided with moist conditions, cannot germinate as expected because of their testa, prematurity, or other obstacles hindering their germination.

However, if the seed is germinated, for it to grow healthier and faster it must be provided with the appropriate environment, which includes fertile soil with the right pH, water, and sunlight. The process of nurturing will continue until maturity. During that process, every disease and obstacle that hinders the growth of the tree can be dealt with according to their appropriate and recommended treatments.

Likewise, the same principle will also apply to each different individual's abilities, even in the case of identical twins. In other words, understanding of the individual's uniqueness and their mental development differences will pave the way for identifying their individual abilities. By understanding, it should be executed and administered through different teaching strategies and learning activities and situations.

On the other hand, the identification process is only the initial step, while understanding and continuous provision of relevant and appropriate environments (activities) are the follow up processes. These stages should be focusing on maintaining the life and developing the skills of each individual learner. As suggested, the daily consistent

observation, recording, monitoring and strengthening of these skills is essential throughout the entire process. In other words, the identifying, understanding and providing assistance for learner's unique abilities (IUPAUA) process is very important. Each step is dependent on the other and cannot be carried out in isolation of the other.

IUPAUA process, opinions and timing

While understanding the importance of the IUPAUA process, it is vital for the responsible divisions, authorities and stakeholders to see every individual person, family member and the national population at large as needing a strategic approach to framing the development of these skills. Myles (2012) states that each person is responsible for the potential stored within them. Therefore, we must learn to understand it and use it effectively. It is high time that this important process be properly and fully diagnosed, assessed and implemented by every citizen and the responsible authorities of this nation, Solomon Islands, or any regional country for that matter.

In addition, every individual skill must be identified and maximized. Unless that happens, the nation will not be able to face the upcoming developmental challenges. For this purpose, education is seen as the best avenue for assisting the learners in uncovering their unique abilities. According to Carson (2012), "if you educate a person you liberate that person". Therefore, if the education truly does liberate a person, then I strongly believe it begins with the mind. This is because, when the mind changes, it changes the decisions and actions taken by an individual person about the things he/ she can do in life.

Hence, "Education for what? Revisited," could be seen as vital and influential in this regard. As shared by Pollard (2016) during the 2016 Vaka Pasifiki Education Conference, education is a powerful tool that can empower people. So the question here is, do we want our Pacific country citizens to be empowered in all aspects of life? I believe this is one of the backbone ideas of the Vaka Pasifiki conferences. If it is so, then it is the right time to make this academic call as united Pacific academics; rethinking how to weave the Pacific mat of educational theory and practices. What is the possibility of realigning the learning process through the IUPAUA process? What could be the collective ideas from the regional academics?

The learning environment could be either through formal schooling or informal learning outside the classroom settings, or both. While the educational goals for empowerment are being partly achieved and continue to be achieved within every education level, it is also important to see education being implemented to its full capacity, satisfying the intended purposes for both individuals and the national population. Furthermore, according to Hudson (2009), in order for a business to operate well and make more profit, the unique potential of every employee must be recognized. This is based on the understanding that the unique abilities of each employee contribute towards business management and production, speed, and quality.

However, where, when and how to uncover the individual abilities of every individual is the core issue and the timing and place for this is seen differently by different academics, according to their own findings and understanding. There is debate about which is the most relevant and appropriate level to do this, and how each age group should be approached differently according to their individual abilities.

Research and its focus areas

This research focuses on how the young Solomon Islands' populations have been taught in schools in relation to their unique abilities to face the challenges and expectations ahead. In other words, the perceptions of teachers from early childhood, primary, and secondary schools with different curriculums were closely investigated in this case study.

The areas of research were focused around the current curriculum adopted by the schools, how it is enhanced using the IUPAUA process, and future curriculum suggestions and recommendations based on this.

It is also important to note that this research covers a wide range scope in terms of the processes. This is, however, a deliberate strategy taken, as a way of protecting the idea for future studies. Thus, this write up will be based on the data already collected, but it will also involve pauses for statements and questions to be researched in the future. This case study is like uncovering the tip of the iceberg, gradually uncovering the next phase and the entire part of the issue in due course.

Methodology

The research was conducted on Honiara-based teachers from three schools. Two data gathering methods were used. The first was the survey questionnaire, which was given to three different levels of education for three different schools, adopting different curriculums. Similar questions were given to the early childhood, primary, and secondary curriculum officers from the national curriculum office, and the Ministry of Education and Human Resource Development. Thus, the Likert scale (strongly agree, agree, partly agree, partly disagree, disagree and strongly disagree) was used to obtain the teachers' perceptions on IUPAUA processes, and the curriculum at their respective schools. The second is a focus group interview, used as a qualitative approach to reveal teachers' understandings of the links identified from the collected data.

Results

The results were drawn into graphs to see the correlation between the teachers' perceptions on the adopted Curriculums, IUPAUA process, and the future recommended curriculum. Also, for general analysis, the Likert scale has been categorized as: "*Agree*" = strongly agree and agree, "*Neutral*" = partly agree & disagree and "*Disagree*" = disagree and strongly disagree.

Part A: Current Curriculums

The following keys with meanings are used to represent teachers' perceptions onto the bar graph.

TULU = Teacher understand that every learner is unique.

TTIP = Teacher trained to implement the IUPAUA process.

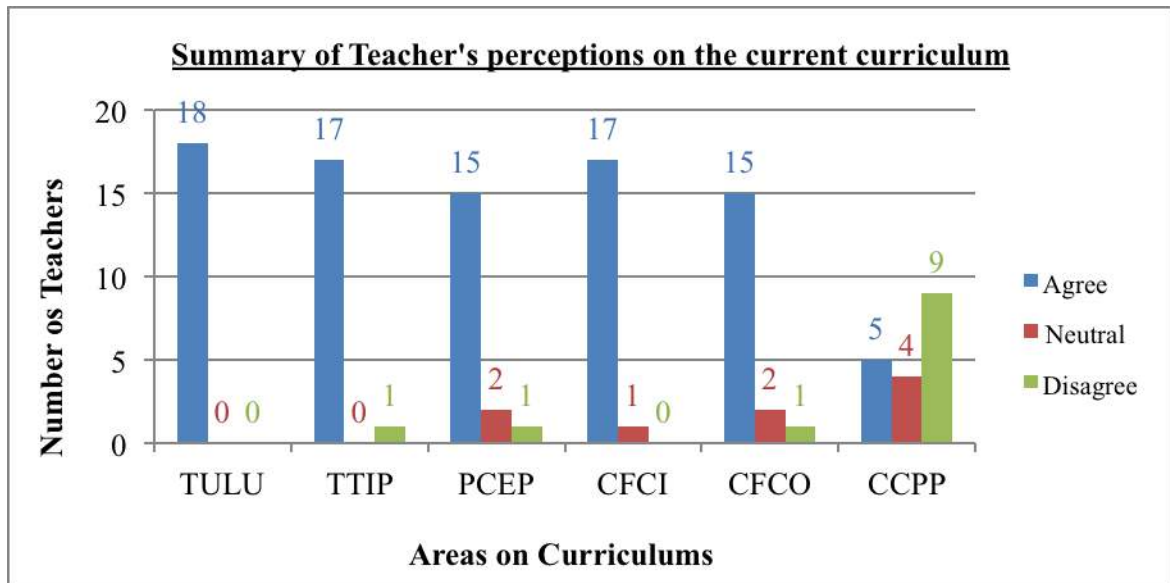
PCEP = Past years the curriculums have enhanced the IUPAUA process.

CFCI = Curriculums designed are focused on subject concepts and individual abilities.

CFCO = Curriculums designed focused on knowledge of subject concepts only.

CCPP = Curriculums cater and provided for the IUPAUA process.

Figure 3: Teachers' perceptions of the learners and the current curriculum

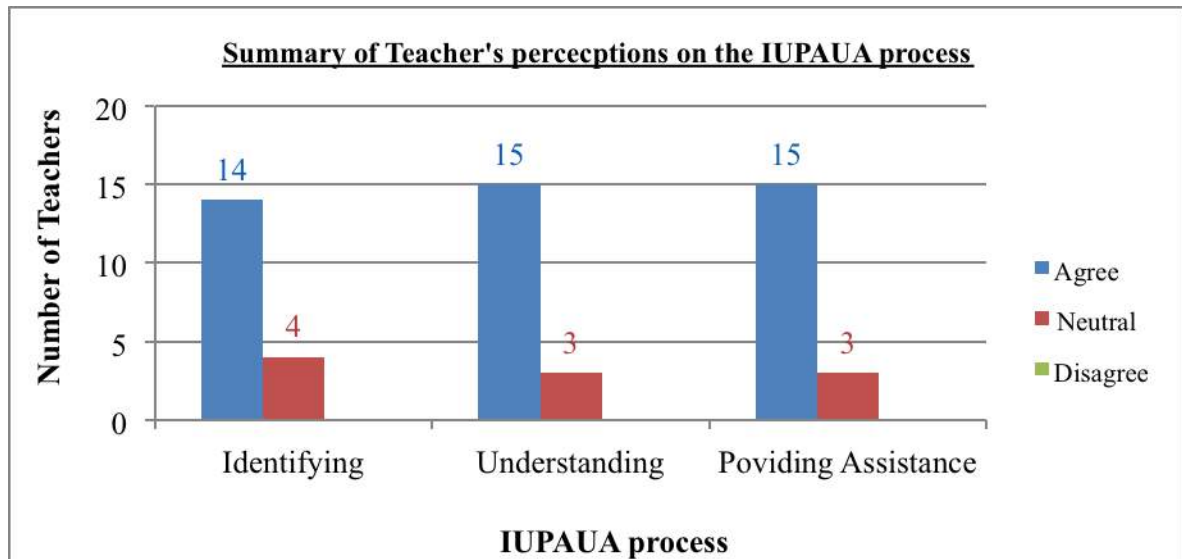


According to the graph, the majority of the teachers are trained and understand that every learner is unique. However, the questions here are: How truly and consistently was this knowledge being assisted and used to motivate the students' learning in terms of their unique abilities? How evident was IUPAUA process in meaningful practices in the life of the teachers? And how did the school and the education authorities experience the effect of this? These are areas of complexity that need to be uncovered and diagnosed at their respective roots and with respective authorities. Unless these areas are addressed, the majority of the young population will not exercise or experience their unique abilities at an early age.

Also, the graph indicates that around 50.0% of teachers believed the curriculum had been designed to serve both the subject concepts and individual abilities. However, this could be slightly varied across the different schools with different curriculums' perspectives and purposes. On the other hand, these results also indicate that over 50.0% of teachers believed that the current curriculums are not catering for the effective implementation of the IUPAUA process. On the other extreme, around 28.0 % of teachers believe that the curriculum has been enhancing the IUPAUA process for the past years. Even then, it also depends on the teachers and purposes of the different curriculums.

Part B: IUPAUA Processes

Figure 4: Overall teachers’ perceptions on the different processes (stages) on the IUPAUA process

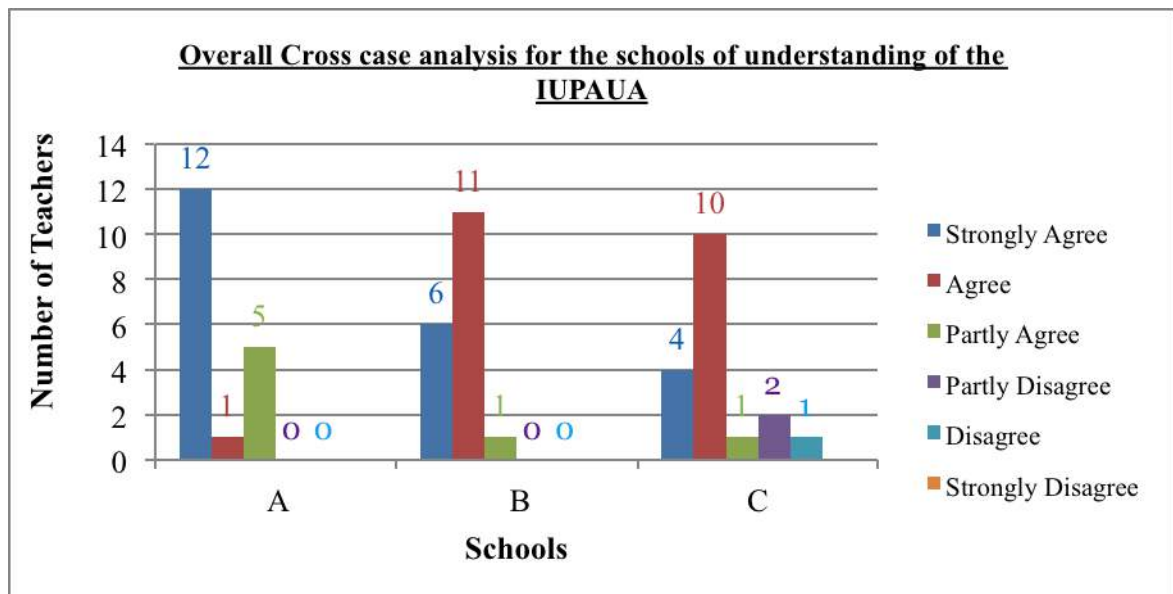


According to the graph, about 78.0% to 84.0% of teachers are executing the IUPAUA process within the three Honiara based selected schools. This simply means that the initiative to adopt the process is already underway within these schools.

However, the questions to consider are: Is the IUPAUA process being consistently done throughout the academic years and education levels? Is there any education framework in place to follow? What is the real situation here?

Such questions should be well-framed and widely researched to assist the education authorities, policy makers and stakeholders to make valuable decisions in implementing the IUPAUA process.

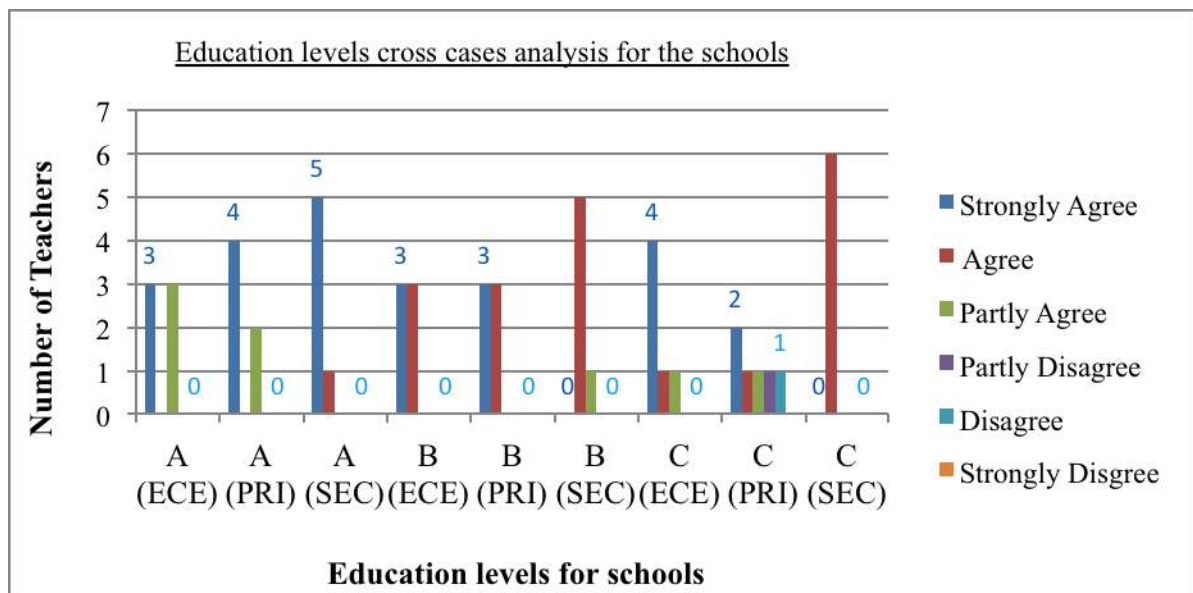
Figure 5: Overall cross case analysis of certainty in understanding of IUPAUA for the selected schools



From the graph, it is evident that the Teachers' perceptions on the IUPAUA process varied across the schools. It is a clear indication that the schools are adopting different curriculums and rather different perceptions.

Looking at the certainty of understanding regarding the IUPAUA process, School A seems to be more certain than school B, and school B than school C. School A had 12 teachers who strongly agreed with and understood the IUPAUA process, school B had only 6, and C had only 4. Also, school A and B's understanding of the process falls within the 'agree' category, while school C is spread out between agree and disagree.

Figure 6: Education levels cross cases analysis for the schools

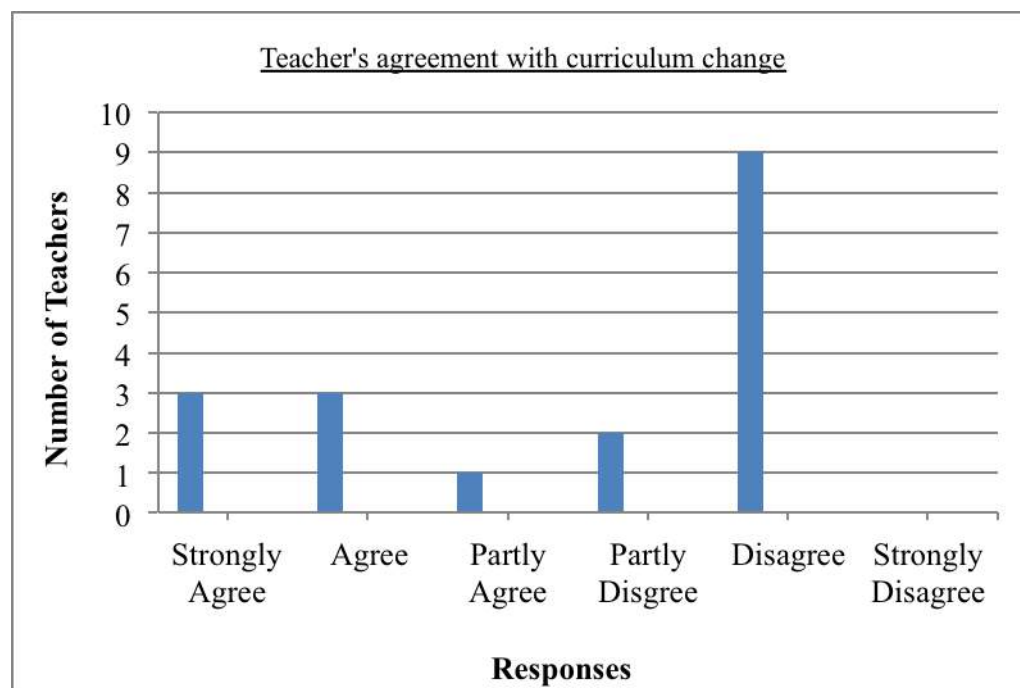


According to the graph, the pattern in implementing the IUPAUA process across the education levels within each school is different. School A has an inclining pattern of executing the process, school B has a slightly constant pattern, while school C shows an irregular pattern. However, if the data is categorized as agree, neutral and disagree, school A will still have the incline pattern across the levels, school B shows a constant implementation across ECE and Primary and a decline for secondary school, while school C has lower levels for ECE and primary and higher levels for secondary.

On the other hand, the above graph has displayed three different IUPAUA process implementation cases across the levels within each school. Each pattern could be relevant and appropriate for its curriculum's purpose. Overall, School A has indicated the most consistent approach to identifying the individual abilities, understanding and providing assistance across the levels.

Part C: The future desired and recommended curriculum

Figure 7: Teachers' perceptions on the need for Curriculum change



According to the graph, the majority of the teachers did not agree with the change of the entire curriculum. Instead, they want to amend only certain portions of the curriculum(s).

Discussion

In general, according to Figure 3, most teachers are executing the IUPAUA process. However, at the moment, it is still subject to the commitments of teachers, education authorities, and policy makers because wide research is still yet to be conducted into the real practices to answer the questions asked earlier. On the other hand, research has yet to reveal that the way teachers undertake the IUPAUA process could be solely accounted for by their individual efforts and commitments.

According to the interviews, what drives most teachers are their individual and family needs (extrinsic motivation), and their heart of service (intrinsic motivation). If they are met, the work will be done as expected. Therefore, both factors played an influential role in their work as teachers. Further than that, when it comes to an extrinsic-work or intrinsic-work basis, both are still executed as expected, but the intrinsic-work basis lasts for a longer period of time, with a more certain degree of consistency and quality.

In addition, the patterns shown by the overall cases across the schools was revealed to reflect the teacher's commitment when there is no framework for implementing the IUPAUA process (Figure 5).

School A and B showed a similar degree of certainty relating to the IUPAUA process, while school C was spread out to certain degree on both the 'agree' and 'disagree' sides. The cross cases analysis across the levels within each school reflects the type of curriculum

being adopted (Figure 6). The above patterns should trigger some sense of urgency in realigning the curriculums and policies to suit the kind of individual citizens that Solomon Islands needs to have now and in the future. In other words, the inconsistency in teaching practices should be reviewed and a new integrated curriculum with teaching practices that will enhance the IUPAUA process should be adopted.

In support of this, the teachers raised the following concerns to consider should the curriculum be reviewed to make relevant amendments:

- Teacher-student ratio. Currently, the ratio is 1:35 and teachers raised concerns about the need to look again into the issue. From their experience, the teacher could not effectively reach or assist every individual student within a 40 minute time frame. Such is seen as one of the huge obstacles to the efficient and effective teaching currently. Thus it will be a challenge to the implementation of the IUPAUA process. Therefore, a ratio that could allow the teacher to reach every single learner within a given time, at all times, and across different education levels, should be considered, assessed and approved, and implemented within the schools.
- There is a need for responsible authorities to closely and consistently work with the teachers within the schools. There should be continuous workshops and conferences conducted for teachers either for upgrading their personal knowledge, responsibilities or meeting the imposed changes and expectations. A continuous interaction with teachers regarding their general expectations is necessary.
- To integrate portions of curriculums and educational policies that are relevant and appropriate to our context and make a curriculum that will provide for the IUPAUA implementation within the schools.
- If possible, the responsible authorities should assess and make some form of recognition for curriculums which are effectively having a great impact on Solomon Islands citizens.

Around 94.4% of teachers have strongly agreed that the IUPAUA process is very important and should start to be adopted at the early childhood level. According to the teachers, children can be easily influenced and are more willing to do what they are told to do at this level. It is the level of role play, where children can express themselves through games and activities. Others thought it was the best level because early identification of children's abilities provides a long period of time to maximize impact and cause influence on their societies.

Conclusion

In conclusion, based on the data collected, teachers are already implementing the IUPAUA process in their respective schools. However, from interview, some teachers are executing the IUPAUA process because of their curriculum expectations, others because of their heart for teaching, while for others it is because of their work. The trend and consistency of the IUPAUA process should also be discussed in due course.

The IUPAUA process implementation is varied across the levels within each school and across the schools. According to the interview findings, teacher's personal commitments and the expectations of its adoption in the curriculum indicated that there should be a mechanism or framework in place to guide and direct the teachers in performing the IUPAUA process.

Therefore, a strong recommendation is, if the IUPAUA process is important for Solomon Islands citizens, then it should be considered and starts making moves to implement it. For instance, diagnosing the issue, assessing it, implementing it, monitoring and continuing to strengthen the weak areas can be carried out as it rolls on. This is of paramount importance because the dormant potential within every individual citizen must be uncovered.

Schools in Honiara currently adopt a variety of Christian based, individualized, or subject content based curriculums. Both offer opportunities for diagnosing learners' uniqueness and enhancing the individual unique abilities of young, talented Solomon Islanders, or people for that matter.

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**Advancing Form 5 “Push-Outs” to Tertiary Level: Solomon Island’s National University’s
Environmental Studies Certificate Program.**

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Abstract

Human capital remains an integral component of the resources required for the economic growth and development of viable societies. Given the urgent need to increase innovative capacity and knowledge transfer to address sustainable development challenges, this paper reports on a study which investigated whether Form 5 “push-outs” perform as well as Form 6 and Form 7 graduates in a tertiary study environment. It argues that a small island nation, like the Solomon Islands, cannot afford to dispense with a “critical mass” of youth by denying them tertiary education due to a limited supply of upper secondary school providers. We provide evidence that Form 5 graduates who are “pushed up” into the SINU Environmental Certificate Program, a tertiary-level program, perform, on average, equally as well as their Forms 6 and 7 counterparts. For a nation in urgent need of skilled human capital to grow and develop its economy and solve sustainability challenges, this finding implies that restricting university admission to only Forms 6 and 7 graduates is not entirely justifiable and that acceleration of Form 5 graduates into university programs is an option.

We acknowledge first year Environmental Studies students who assisted in organising the data for analysis: Jill Houma; Fostina Taega; Newton Raiine; and Obrian Forau.

Keywords: Higher Education, Human Capital, Economic Growth, Critical Mass, Acceleration, Access

Introduction

Human capital is the underpinning of economic growth and development in all modern societies. The development of this indispensable resource through higher education remains a topic of important academic, social, and policy discourse. The central issues in the current discourse, particularly in developing nations, include access to higher education, the merits of acceleration, the appropriateness and relevance of content in education programmes to both societal and labour market needs (Merrotsty, 2008; Romer, 1990). Given the urgent need to increase innovative human resource capacity and knowledge transfer to address sustainable development challenges, this paper argues that the Solomon Islands cannot afford to dispense a “critical mass” of its youth by denying them tertiary education based on limited access to Form 6 and Form 7 programs. We further argue that creating opportunities for disadvantaged youth who have completed Form 5 to access relevant and accelerated higher education not only empowers these youth, but also increases capacity to achieve the nation’s economic growth and sustainable development agenda. The emphasis here is that in a multi-pronged development strategy, all levels of education are important (Bloom et al., 2006).

Environmental challenges are currently of global and national concern. The Solomon Islands, through its National Capacity Self-Assessment (NCSA) Project (Thomas et al., 2007) recognised the need to train qualified environmentalists at tertiary level to address biodiversity and global climate change challenges outlined in the 1992 Rio Convention. In line with the nation’s effort to create capacity to deal with these challenges, the Solomon

Islands' National University (SINU) established the Environmental Studies Program within the School of Natural Resources and Applied Sciences (SNRAS) in 2010. The program, which currently runs a Certificate course in Environmental Studies (CES), targets Form 5 graduates who are usually excluded from continuing their education, as well as graduates of Forms 6 and 7.

The NCSA project identified lack of scientific knowledge of and research about Solomon Islands' environmental issues, including sustainable development challenges in the face of climate change. SINU's Environmental Program focuses on expanding training to increase environmental management capacity, and to contribute to good governance and stewardship of natural resources at national, provincial, and community levels. These were precisely the issues the NCSA wanted to see addressed in the Solomon Islands' National Environmental Capacity Development Action Plan (NECDAP, 2008-2012).

The Environmental Studies Program at SNRAS is, thus, aligned with national capacity priority needs. Subsequent to the 1991 National Workshop to develop a National Environment Management Strategy (NEMS), and in response to NECDAP (2008-2012), the Environmental Course Advisory Committee (ECAC) was constituted. The role of the committee was to provide advice and technical input, among other things, towards the development and the delivery of the Environmental Studies Program. Membership of the ECAC was drawn from public and state institutions, as well as private sector organizations. Together, these stakeholders ensured that the curriculum of the program met global, labour market, and industry demands.

The Solomon Islands' Qualification Framework (SIQF) sets the minimum entry requirement for diploma courses at Forms 6 and 7, or foundation courses. Thus, there is virtually no opportunity for Form 5 graduates to access tertiary education. Not every individual must access tertiary education, and non-academic avenues (such as trades) should not be created for this critical mass of youth. We argue that for a nation in critical need of well-informed decision-makers and managers, as well as intellectual capacity to lead in the modern knowledge-based global economy, the Solomon Islands simply cannot afford to dispense with any academically capable youth. Furthermore, to achieve the National Education Action Plan (NEAP), the nation must strive to ensure equitable access to education and to improve the quality of education to exploit each child's full academic potential.

Underpinned by assumptions of the importance of education in human capital development and, hence, economic growth and national development (Adedeji and Campbell, 2013; Bloom et al., 2006; Lucas, 1988; Mankiw et al., 1990; Schultz, 1961, 1988); and in addressing environmental problems and security issues, and ensuring sustainability, (Adedeji and Campbell, 2013; Bloom et al., 2006), the paper highlights the current situation in the Solomon Islands. It also reports on a study which investigated if Form "push-outs" perform as well as Form 6 and 7 graduates in a tertiary study environment.

The Solomon Islands context

The importance of educational systems being closely aligned with labour market demands is well-articulated in the literature (see, for example, Clark, 2001; Boateng, 2002; Saint et al., 2003). To ensure adaptive response to labour market demands, SINU's Department of Environmental Studies has structured its curriculum based on the local labour market requirements without losing sight of the program's global relevance. The Department's Board – comprising of stakeholders from the country's line ministries (Environment, Forestry, Mines, Fisheries, Development Planning, Foreign Affairs, and Education), international NGOs dealing with environmental issues, Honiara City Council, and academic

staff from SINU – reviews existing curricula, and approves proposed future ones. Thus, by engaging with institutions and organisations which are potential employers of the graduates, the Department ensures the relevance of its program content to both the local and international market.

To take advantage of and benefit from the current global knowledge-based economies, it is imperative that Solomon Islands prioritises human capital development through making tertiary education accessible to its youth at all levels. Tertiary education offers better employment and income opportunities to under-privileged students, thereby reducing inequity in society. It also enhances analytical skills and develops capacity that supports civil society and drives local economies (Malik, 2002). However, the provision of tertiary education requires substantial capital investment in the education sector, and effective monitoring to ensure efficient utilization of resources, fairness, and equitable access.

Adedeji and Bamidele (2003) link three unique features of education – content, access, and openness to labour market demands – to economic growth and development. Further arguments for removing barriers and increasing access are offered by UNESCO (2005), Psacharopoulos and Patrinos (2004), and Aluede et al. (2012). To emphasise the danger of exclusion based, for example, on previous performance, Tomas Lindahl, a 2015 Nobel Laureate in Chemistry noted, “one teacher [in High School] failed me in Chemistry”.

In Solomon Islands, however, access is an issue. With only 248 secondary schools (Iroga and Peupelu, 2015) serving a population of nearly 600,000 (Andersen et al., 2013) – that is, one secondary school for every 2,419 citizens – a good number of the youth are left behind, with the loss of vital human resources that could be harnessed to assist in the nation’s development agenda. Youth outside of the city centres have least access to quality primary and secondary education and, thus, are disadvantaged when competing for tertiary education outside of the country (Iroga and Peupelu, 2015).

Another dimension of our focus, as mentioned above, is academic acceleration. It has been shown that advancing students to higher levels results in high motivation and productivity (Merrotsy, 2008). Proponents of accelerated education argue for more flexible organizational patterns to permit student progression based on individual development and performance (Braggett, 1985; Forster, 1994); a broad, balanced, quality, and contemporary curriculum, taking into account the needs of students of differing abilities and backgrounds. The argument should be how to assist students in special circumstances to realise their potential, not to curtail educational opportunities based on supply of higher education (Porath, 2013; Ziegler, 2005). Clearly, it makes good policy sense to remove barriers to education in the Solomon Islands, to build the intellectual capital needed for sustainable development.

The study

Participant selection and data collection

We administered questionnaires to current SINU students, graduates of the program, and environmental stakeholders to evaluate perceived quality and employment benefits of the Environmental Studies Program. We also compiled information about the number of students who complete Forms 5, 6, and 7 in the Solomon Islands, to estimate the annual “supply” of Form 5 push-outs. Finally, we assessed the impacts of acceleration by comparing performance in the SINU-SNRAS Environmental Studies Program of Form 5 push-outs with that of Forms 6 and/or 7 graduates.

Three student groups were identified based upon their time in the Environmental Studies Program: Cohort 1, students in the first year of the program; Cohort 2, students in the second year of the program; and Cohort 3, students who had graduated from the program. The third cohort were selected using their current work addresses, and was thus biased towards students who had successfully found employment in Honiara. Cohorts 1 and 2 were surveyed near the end of the first semester, 2016.

As typical of qualitative inquiry, we relied on relatively small samples selected purposefully (Patton, 1990). While our combined sample size meets statistical criteria for representativeness, the graduate and public and private institutions groups are each less than 30, which is well below statistical representative requirement. However, according to the literature this is not problematic for qualitative inquiry.

Student academic performance can be compromised by a number of issues, and the situation of students in the Environmental Studies Program is no exception. To better understand some of the real issues, besides individual students' personal attitude to studies, we asked current and past student respondents to indicate their sources of educational funding for both living expenses and tuition fees. The underlying assumption is that financial challenges significantly affect student academic performance.

Opportunistic Sampling was employed to select public and private institutions and organisations in Honiara, the capital city of the Solomon Islands that are, or would be likely to be, employers of the SINU Environmental Studies Program graduates. A total of 35 questionnaires were distributed to these potential employers or stakeholders, as they were either directly or indirectly involved in environmental activities or policy formulation, and implementation at both national and local levels. The duration of the CES program is currently under review. Respondents from the three sample groups were asked to indicate their preference for a one-year or a two-year program. We also sought respondents' views on whether or not the entry requirement should be revised to eliminate Form 5 entrants from the program.

Secondary data about numbers of students were obtained from the Student Records Office at SINU, and Secondary School Division, Ministry of Education and Human Resource Development (MEHRD). The data included student enrolment at the Department of Environmental Studies of SNRAS, total applicants to the program, and national data on Secondary School enrolment levels for 2014 and 2015.

Findings

A total of 91 students answered the questionnaires (50 from Cohort 1 and 41 from Cohort 2). Thirteen responses were obtained from the graduate group. Since its inception in 2010 the CES program has increased its annual enrollment from 27 students to 109 in the 2015 academic year. During the 2015 academic year, intake of Form 5 graduates constituted approximately 25% (SAS, 2016). Enrolments have been from students across the nine provinces of the country. For example, according to the SINU Student Records Office, during the 2010-2012 enrolment period, Malaita, Guadalcanal, and Western provinces registered 29%, 26%, and 21%, respectively, with the rest proportionally distributed across remaining provinces (SAS, 2013).

Challenges encountered by students

It was observed that, although some students struggle academically in the first year of their studies, they tend to do better in the second year of the program. This is expected as students

adjust to the norms of the program, teaching styles of instructors, and life in Honiara. Most students enter the program with weak background preparation in English, the sciences, and math due to inadequate secondary school training.

Of the 91 students surveyed, nearly all said that financial, medical, and living conditions (food and housing) were the most challenging aspects of staying in the program, not the academic challenges. Nearly 65.4% of all continuing students and graduates sampled were supported by their parents while attending the university. About 23% were supported by other relatives, and 6% were financing their own education. Other sources of student support accounted for only 5.6%, and this would include church or government scholarship support.

Not surprisingly, when asked “who paid your tuition?”, the results were similar to “who supported your education?” Parents were found to be the main contributors towards student tuition fees (62.9%), with government sponsorship accounting for only 13.3% of the students sampled. Tuition fees provided by relatives and other sources were 8.6% and 14.3%, respectively. According to the Environmental Studies Department Survey (2016) Non-Governmental Organisations (NGOs) supported only 0.9% of students (Environmental Studies Department Survey, May 2016).

Access

Of the 248 secondary schools in the nation, only 12 (about 4.8%) offer Form 7 education, and 21 (approximately 8.5%) offer Form 6. On the other hand, 62 (25%), nearly double the number of all of those offering Forms 6 and 7, offer Form 5 education. The majority, 153 (about 62%), provide education only through Form 3. Thus, most of the nation’s youth have little or no access to Form 5 education, let alone Form 6 and 7.

In 2014, about 53.5% of students exiting Form 5 gained admission into Form 6, with the remaining 46.5% being “pushed out”. In absolute terms, this translates to 2,750 students. Likewise, only about 19.7% of those exiting Form 6 got placements in Form 7 in that same year (2014); another 2,540 students were unable to access tertiary education which requires Form 7. These statistics indicate that students in Form 5 have only an 11% chance of getting into Form 7.

Repeating the analysis for 2015, the results worsen: 44% of Form 5 graduates were pushed out (i.e., 2,381 students), and nearly 81.5% (i.e., 2,519 students) graduating from Form 6 could not gain access to Form 7. Thus, for those entering Form 5 in 2015 their chances of entering Form 7 two years down the line was only 10%.

Student performance

A key finding is that when comparing grade point averages (GPAs) of students in the program in 2013, 2014, and 2015, statistically, there was no difference in the average performance of the two student groups (i.e., Form 5, and Forms 6 and 7, groups) across cohorts.

Student and public perceptions

Students and graduates were asked to rate the quality of the program on a scale of 1 to 10, where 10 is the best. The program received an average rating of approximately 6.4 and 5.9 from current students and graduates respectively. Public institutions and organizations, where past graduates of the program are currently engaged as employees, put performance of graduates from the program at a 6.4 average rating.

About 73% of all respondents suggested that the entry requirement for the CES program should be a minimum of Form 6. Only 13% and 11% favored entry at Form 5 or Form 7, respectively. The remaining 3% specify other requirements such as work experience after Form 5, or lower level secondary education. The result is not surprising given that many university programs require Form 6 for entry. In addition, only 15% of respondents from the samples were Form 5 graduates.

About 80% of the 132 respondents indicate the CES program is relevant, and support its continuation. Approximately 62% (i.e., 92 of 148 respondents including stakeholders) showed a preference for a one-year certificate program. This supports the acceleration argument and trends at SINU. As part of the Department's strategy to advance the Environmental Studies Program to a Bachelor degree in the near future, a one year certificate leading into a diploma is being proposed.

Discussion and conclusions

If access to education means anything to the state and the general public, then government and civil society should be seen to be playing a bigger role. In societies where educating the youth is no longer a challenge, the question of state involvement in the provision of educational services is arguably not an economical option. However, in situations such as Solomon Islands where education remains a privilege for the fortunate few, government and civil society intervention becomes crucial.

To help counter environmental environmental challenges and to fulfil its objectives to help address capacity needs, SINU has provided a two-year certificate course targeting Form 5, as well as Forms 6 and 7 exiting students. The results of our study present a positive and encouraging image for the program, indicating a promising future growth and acceptance in the labour market. It is also SNRAS's belief that this mass of the nation's youth will eventually be able to join the Department's diploma and bachelor degree programs due to commence in the very near future, also designed to fulfil a national obligation, and as part of SNRA's objective to help address national capacity needs. Human resource capacity in environmental management is a key requirement in public awareness creation and information dissemination for sound decision-making in addressing environmental challenges.

Given that a critical mass of Solomon Islands youth still remains outside the tertiary education system, it is questioned whether a policy shift in favour of Forms 6 and 7 graduates, entirely eliminating the current Certificate Program, and replacing it with a Diploma Program with the subsequent introduction of a Bachelor's Degree Program is justifiable? National and SINU policy makers need to bear in mind that to avoid a human capital tragedy we must reduce the percentage of Form 5 graduates failing to get Form 6 placements. This number fell only marginally from 47% in 2014 to 44% in 2015, a mere 3 percentage point improvement (Iroga and Peupelu, 2015).

The chance of attaining a tertiary education is currently severely limited in the Solomon Islands. The poor access to secondary and tertiary education in the country is partly due to the unequal distribution and content of education at primary and secondary school levels. Given this situation, we ask: why deny Form 5 and many Form 6 graduates the opportunity to acquire the knowledge and skills to become informed decision-makers and managers in a nation with huge needs and demands for these human resources?

In conclusion, our findings suggest that many Form 5 push-outs can be accelerated successfully into diploma and degrees via certificate programs that are challenging and linked to real societal needs, such as sustainable and environmentally principled development.

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Enhancing Education Success through Talanoa: A Framework for the Pacific

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Subtopic Area: Talanoa, Oral Education, Educational Success, Teaching and Learning

Abstract

Talanoa is a traditional means of oral communication common to the Island nations of the Pacific. This paper introduces a framework for lifting student success and retention at early childhood education, primary and secondary schools for Pacific students learning in a social context outside of their own culture. The framework is based on traditional *talanoa* as a research tool and methodology. In particular, the paper discusses the application of *talanoa* as part of the assessment process, curriculum development, teaching and learning, and evaluation. The proposed framework draws on the experiences and design of the Te Kotahitanga project, introduced in New Zealand in 2001. It will be relevant to the ongoing aim of improving educational success and retention among Pacific students. Given the discussions drawn from experiences in New Zealand over the past twenty years, it will be of particular relevance to local policy developers.

Introduction

The educational success and retention of Pacific students has been a concern of the New Zealand government for the past 30 years. This has been largely prompted by the relatively poor achievement rates among both Māori and Pacific students in New Zealand. In 2008, 76.3% of Pacific students achieved NCEA level 1 compared to 82.3% for non-Pacific students. For school leavers completing the requirement to enter university, the rate for Pacific students is 20.3%, compared to 40.1% for non-Pacific students. Although these rates were for state schools only, the level of discrepancy for private/integrated schools is similar (Statistics New Zealand, 2013). The relatively low rate of educational achievement has translated to comparatively low achievement rates in employment and economic prosperity. Pacific people in New Zealand are also over-represented in relation to poor health, crime, and imprisonment. While these latter statistics are not exclusively linked to education, the correlation between poor educational achievement and these other indicators is significant.

While the evidence regarding poor educational achievement is abundantly available, the reasons for the existence of such a sustained discrepancy between Pacific students and the rest of the New Zealand student population continue to be sparsely documented. This paper aims to provide a framework for understanding the potential causes of this discrepancy. The paper also suggests how *talanoa*, together with a number of traditional practices in teaching and learning, may be able to assist in addressing this discrepancy.

This paper is divided into three sections. The first section reviews the reasons recently offered to explain the discrepancy in educational achievement rates. The second section discusses the Te Kotahitanga model introduced in 2001 together with a number of cultural practices that have been used in the Sunday school settings in Pacific people's churches. The third section discusses the proposed framework for enhancing educational success for Pacific students. This section also includes the specific application of *talanoa* as a tool and

methodology in the assessment, design and implementation and evaluation of the proposed framework.

Section 1: Reasons for Discrepancy – A review of work to date

The Impact of Parent and Community Engagement

A number of writers have suggested possible causes for the discrepancy in educational achievement. Biddulph et al. (2003) suggests parents and community involvement contributes positively to educational success. Parent and community involvement in the child's education has taken on in a number of different forms. In the New Zealand setting, Pacific parents will certainly encourage their children to go to school in recognition of the future benefits that will come from it. Parental involvement, in this case, comes in the form of taking them to school and providing the resources needed. However, only a small proportion of Pacific parents will have an active role during their primary, intermediate, and secondary school years. Many Pacific Island communities, particularly churches, have spearheaded the drive to encourage education success. This has taken on the form of homework centres and specific celebrations during the year to recognise and encourage students and parents alike. Parental and community participation is most pronounced once the child has successfully reached the end of their academic journey. Active participation during the child's academic journey is often not present.

McDowall et al. (McDowall, Boyd, Hodgen, & Van Vliet, 2005) and Madjar et al. (Madjar, McKinley, Jensen, & Van Der Merwe, 2009) suggest parent and community involvement is limited by their ability to participate in the learning process. Some parents feel their own personal educational achievement is insufficient to support their child. While this may be the case for some parents, their ongoing encouragement and support is needed to raise the child's sense of confidence. Although parents may not be able to appreciate the specific knowledge base in some of the more technical subjects, they are nevertheless able to participate in the basic literacy and numeracy development, which is the foundation of the child's future educational success.

Robinson et al. (Robinson, Hohepa, & Lloyd, 2009) suggest reading projects involving parents and teachers have had successful results where such programmes have been implemented. A study in Auckland revealed that, in the case of St Joseph School in Otahuhu, parents engaged with their children through talking and reading with them at home and, thus, helped to raise achievement levels in both literacy and numeracy. Homework centres based in the community and through the churches have increased the educational success of the students who are part of these communities. The United Church of Tonga in Auckland has been running an education programme across its various branches in Auckland for over the past 20 years. The programme has resulted in this relatively small part of the Tongan community, showing a higher than normal academic success rate per head than other similar church congregations in the region. These initiatives and studies indicate parent and community involvement in the student's learning has a positive impact on educational success, but that the degree of this positive impact is likely to be greater if the specific role of parents and teachers is better understood.

While there are examples of high levels of parent involvement in student learning, many in a number of schools in New Zealand continue to display parent engagement practices that are, at best, superficial. Evaluation of schools in New Zealand by the Education Review Office

(ERO) in 2008 revealed that, for many schools, Pacific parents are only contacted by the school when something bad happens (Education Review Office, 2008b). Furthermore, the ERO report highlighted that the information provided to parents through newsletters and reports were insufficient to provide a clear picture of poor student success and engagement for many Pacific parents (Education Review Office, 2008a). These results are despite Pacific parents showing a significant interest in the educational success of their children (Biddulph et al., 2003). These studies indicate that parent and community engagement in the child's education needs to be complemented by having effective and relevant information flows.

In the last five years, advances in technology and greater access to such technology by Pacific peoples have improved the communication flows between parents and students. Many schools in Auckland, including those with high Pacific student enrolment and low decile ranking, will collect the mobile telephone numbers and emails of parents in order to contact them during the day when their child is absent from school without prior notification. The automated system is, and provides, a window into knowing what the child is doing during the school day by sending automated texts and emails to parents. It is currently being used in Kelston Boys High School and Kelston Girls College. Both these schools have a high proportion of Pacific students and are decile 3 and 2 respectively.

The Influences and Impact of Culture

Some authors have identified differences in culture as a driver of disparities in educational success for Pacific students (Meade, PuhīPuhī, & Foster-Cohen, 2003). Ferguson et al. (Ferguson, Gorinski, Wendt-Samu, & Mara, 2008) suggest that respect for one's elders in the form of not challenging authority has had the effect of disengaging Pacific students in the classroom. These studies have revealed an issue that requires some contextualisation. Respect for elders is indeed a well-entrenched value within many Pacific cultures. The foundations of this are grounded in the traditional social hierarchical structures of the Pacific and in Christian beliefs. In the early years of educational development, this entrenched value base may actually benefit the learning process. As students progress through to more senior levels of study, where critical reflection and independent learning are present, the challenge becomes one of self-confidence rather than hierarchical boundaries of respect. Pacific students in the New Zealand context are capable of learning through critical reflective techniques, provided they are in an environment where this is encouraged and where they feel safe to participate. The Te Kotahitanga framework discussed in section two below is an example of such an initiative.

A number of studies indicated that Pacific students were more than twice as likely to be harassed about their culture, compared with European and Asian students (Wylie, Hodgen, Hipkins, & Vaughan, 2009). In response, some Pacific students have suppressed their Pacific culture in an effort to better fit into the school environment. These observations and studies echo practices in education that go back many decades. The introduction of education in the Pacific Island nations was carried out with the assumption that educational success required a wholesale shift away from the indigenous culture in favour of adopting the one upon which the education system was built and administered. Students were encouraged, and sometimes forced, to speak English at the cost of losing both their native language and their culture. Students were expected to mould themselves to suit the education system, rather than the system adapting to meet the specific needs of the target audience. In New Zealand, only 14% of New Zealand schools have been identified as being effective for Pacific students (Education Review Office, 2007). Although this is an example of changing the system to suit

the needs of the target audience, the relatively small percentage suggests that there is still a long way to go.

Zyngier (2008) outlines that students from backgrounds that are similar to those of the predominant culture of the school are more likely to succeed academically. The challenges arise when the dominant culture of the school no longer reflects the home culture of the students. The logical solution to increase student success in situations where the home culture of the majority of students is not that of the school, is to change the nature of the school itself. Learning a new language uses the first language as the foundation towards achieving this. A government report by the Ministry of Education outlines that “a child’s first language is the foundation on which to build their knowledge of English” (Ministry of Education, 2003, p. 4). However, contrary to this, it is known that in an effort to be more accepted in a western learning environment, Pacific students have suppressed their Pacific culture through abandoning their native language (Franken, May, & McComish, 2005). The disconnection between learning English through the first language, and enhancing learning through adopting a western cultural framework has been detrimental to Pacific student success. Consequently, reading and writing skills among Pacific students continue to lag behind non-Pacific students (McNaughton, Phillips, & MacDonald, 2000).

Franken et al. (2005) suggest that students who are bilingual experience a greater depth of learning experience, as they are able to process information from multiple language dimensions. In learning environments where bilingualism has not been encouraged, the opportunity for Pacific students to realise this is lost. Although there continues to be a lack of specific research on the effects of bilingualism for Pacific students, achievement statistics indicate that students who spoke their native language at home were generally more likely to be low achievers (49%) compared to those who spoke English at home (20%). This suggests that parents and teachers who maintain a rigid demarcation line of speaking English only at school, and parents insisting that their Pacific language only be spoken at home are potentially decreasing the depth of the learning experiences for their children. The conflicting messages indicated by this anecdotal evidence highlight the need for further, more targeted research in bilingualism in the Pacific context.

The Impact and Influence of Early Childhood Education

The impact of early childhood education (ECE) on the educational success of Pacific students is well-documented and, for the most part, positive. While not unique to Pacific families, the experiences that children have during their early development (years 1-5) create a firm foundation upon which the future of their educational success is dependent on. Establishing a firm foundation in terms of attitudes to learning, confidence, perseverance, curiosity, questioning and critical thinking is important for the child’s ongoing educational development. The New Zealand experience in childhood education has been mixed. Good practices that embrace the culture of the child often lack the notions of confidence building, curiosity, questioning, and critical thinking. Furthermore, some early childhood centres do not recognise the pathways to learning, which many Pacific children follow. Future development in this area requires a shift in the partnership responsibilities of the ECE centres, parents, and regulatory authorities.

Many Pacific families do not take their children to ECE learning environments. The reasons for this are not clear, though a lack of understanding of the benefits that these centres hold for their children is probable. ECE centres focusing on the needs of Pacific children will need to

incorporate the key role that they have in the child's education life cycle, while further communicating the value that they add to the process.

Attendance, Engagement and Success

Engagement in the classroom has been identified as a potential contributor to educational success. Recent trends in New Zealand show that truancy rates have dropped in the past 10 years, indicating that attendance is no longer the leading reason for non-engagement. The focus is now on increasing engagement in the classroom. While this paper does not attempt to provide a summary of the extensive literature that has been carried out in this area of student engagement, a number of important findings are captured here for the purposes of creating the setting for the proposed framework discussed later.

A number of studies support the notion that student engagement is a precursor for academic success (Harris, 2011; Zyngier, 2008) and reducing the rate of dropouts (van Uden, Ritzen, & Pieters, 2013). Although these studies discuss student engagement in a non-ethnic specific context, the principles are applicable to and accentuated for ethnic minority populations. The relatively low educational achievement levels for Pacific students are linked to low levels of engagement. Strategies to increase Pacific student engagement will, therefore, contribute positively to closing educational disparity.

The nature and depth of student engagement is also important for educational success. Attendance in the classroom is one level of engagement, but may not translate to student engagement at the cognitive level and in the learning process (Zyngier, 2008). Harris (2011) differentiates between behavioural and psychological engagement, and the more important cognitive engagement that is essential for effective teaching and learning. For Pacific students, their presence in the classroom is not correlated with their academic achievement rates, suggesting that they are not mentally engaged. The added complexity of Pacific ethnicity and cultures can result in Pacific students not engaging (Kelly, 2008).

The role of the teacher and their skills in encouraging and facilitating engagement in a multi-ethnic context has been the topic of a more recent line of inquiry (Ecclestone, 2007; Kelly, 2008; Villegas & Lucas, 2002). Harris (2011) acknowledges the importance of teacher understanding of what makes for effective engagement. Van Uden et al. (van Uden et al., 2013, p. 52) suggest that "teachers' perception of their interpersonal behaviour, their feelings of self-efficacy and their understanding of the importance of didactic and pedagogical competence are related to perceived student engagement." They suggest that their findings support the development of a teacher profile that is associated with greater levels of perceived student engagement. This concept of a teacher profile is consistent with that developed in 2003 as part of the Te Kotahitanga initiative discussed in the section two below. While there is evidence that initiatives aimed at increasing student engagement through teacher profiling is present in some schools in New Zealand, the majority of teachers are not equipped to address effective engagement strategies for Pacific students (Education Review Office, 2009).

Section 2: Te Kotahitanga

This section briefly introduces the Te Kotahitanga framework, and how it has incorporated traditional values and beliefs from the Māori Culture into the teaching and learning environment. Bishop et al. (Bishop, Berryman, Cavanagh, & Teddy, 2009) suggest that the

reason for the significant disparity between educational achievement for Māori students, compared with students from a largely European ancestry is due to the current education system being built on a neo-colonial framework that ignores the presence and role of other cultures. They suggest that the present system has been developed “to serve the interests of a mono-cultural elite” (p. 2). Furthermore, they argue that the solutions to lifting the educational success of students that sit outside this “elite” group are not to be found in the mainstream culture, but rather from those cultures and communities to which these individuals belong. Although the study specifically addresses disparities between Māori and Non-Māori students, the findings are relevant in other minority student groups, including those from the Pacific.

The Te Kotahitanga initiative began with interviewing students, parents and teachers to determine the need and demand from a Māori student’s perspective. The data was then analysed and used to determine three key issues. The first included identifying the key areas of concern from a student’s perspective. The data was also used to update and increase the teacher’s awareness of the specific struggles that Māori students were experiencing. This would, in turn, allow teachers to see education through the eyes of the student. Lastly, the data was used in conjunction with other studies to create a dynamic and collaborative learning environment (Bishop et al., 2009). The project then turned to developing a framework that reflected the issues raised in the interviews, together with Māori culture. The outcome was the creation of the Effective Teaching Profile (ETP), which is characterised with the following core components.

1. *Manaakitanga* – teachers care for the students as culturally-located human beings above all else
2. *Manamotuhake* – Teachers care about the performance of their students
3. *Whakapitingatanga* – Teachers are able to create a secure and well-managed learning environment through incorporating routine pedagogical knowledge, wit, and pedagogical imagination
4. *Wananga* – Teachers are able to engage in effective teaching interactions with Māori students as Māori
5. *Ako* – Teachers are able to use a range of strategies that promote effective teaching and learning relationships with learners
6. *Kotahitanga* – Teachers promote, monitor, and reflect on outcomes that in turn lead to improvements in educational success for Māori students.

(Bishop et al., 2009)

These six core components represent the value base for the effective teaching profile and are administered with the following strategies:

- Anti-deficit thinking
- Acknowledgement and fostering relationships
- Adopting innovative and culturally appropriate teacher student interactions
- Challenging the dominant traditional interactions between teachers and learners

The Te Kotahitanga project was then implemented in 2004 and 2005 via a teacher professional development programme involving 12 schools and 422 teachers. Although the evaluation of the project is ongoing, the early indication is that it has lifted both the level of student engagement in class and achievement levels. Kelston Girls College, one of the

participating schools in West Auckland, has experienced an increase in student achievement rates above the national average following the successful implementation of the programme. The results, however, are not specific or unique to Māori students, as the effective teaching profile was implemented school-wide and embraced by students in general. In the case of Pacific students attending the school, the Te Kotahitanga philosophy appeared to resonate well with them. As with the other ethnic cohorts, Pacific student achievement levels are now above the national average.

Section 3: A framework for Enhancing Educational Success through Talanoa

This third section of the paper brings together the threads of literature discussed earlier, including the Te Kotahitanga initiative introduced in 2001. These threads are discussed in the context of Pacific educational success and retention. The discussions also draw on *talanoa* as a means for carrying out the process, including planning and design, implementation and even evaluation. A number of cultural and traditional practices are introduced here as a specific pathway forward for enhancing Pacific student educational success.

The education system in New Zealand is complex and involves many participants. The levels at the government agency are as follows:

- Ministry of Education (MOE),
- Education Review Office (ERO),
- Tertiary Education Commission (TEC),
- New Zealand Qualifications Authority (NZQA),
- Various public schools at the primary, intermediate and secondary school level.

Delivery of education services or courses is done by registered educators across the public and private education sector. The curriculum and assessments tools are created and moderated at a national level, and are delivered to an audience that is regionally-based, diverse and multicultural. The design and implementation of education services and programmes has been largely authored by government agencies and professional third parties, with little input from the audience that it is supposed to most benefit. The Te Kotahitanga initiative is an example of a programme that has re-engineered the education process to directly involve the views of students, parents and community in the design, implementation and review of the teaching and learning experience. For the Māori, this has meant a whole review of the teaching pedagogy to ensure the inclusion of Māori culture, traditions, values and beliefs. The accumulated literature on education by ‘Māori for Māori’ has created the ‘tipping point’ for change to happen. For Pacific education, this initiative should encourage change and development in education to address the disparities in educational achievement that currently exist for Pacific students.

Researchers and academics in the area of education are perhaps partly to blame for the lack of development in the Pacific education frontier. Helu-Thaman (2003) recognised the possibility that Pacific researchers, who are partly responsible for guiding the development of Pacific pedagogy and educational success, are themselves the product of the same education system that they are now obliged to review and challenge. Nevertheless, she admits that this is possible provided that such researchers are aware of this potential bias.

The Proposed Framework for Change

The proposed framework for adapting the education system with a view to improving the educational achievement of Pacific students is based on the process used in the Te Kotahitanga initiative. This process involved directly engaging with students, parents and community to determine the needs and demands of students. This was done in such a way as to reach a level of understanding that would, in turn, inform the development of tools and methods that are suited to the specific audience who participated in its design. The effective teaching profile that was developed for Māori may be suitable for other student groups. However, this is a dangerous presumption to make, and it defeats the purpose of designing a system to suit a Pacific student audience. Although the eventual outcome may be a profile that is similar to what developed through the Te Kotahitanga initiative, this will only be known once the process has been carefully and diligently worked through.

The process used in the Te Kotahitanga initiative is not new to the commercial sector. In the 1980s, accounting researchers, including Kaplan and Norton (1996), extended financial measurement to incorporate non-financial measures such as innovation and customer satisfaction. During this period, businesses adopted a more customer-focused approach, and invested in ongoing survey mechanism to ensure that they maintained a clear and current understanding on customer preferences and demands. The shift towards better understanding the preferences and demands of the target market is not only good business practice, but one that can help improve education achievement. The process, including data collection from the target market, data analysis, and developing innovative strategies based on this data, is applicable to any situation. In the context of Pacific education, it is the manner in which these three generic steps are carried out that is important. *Talanoa* is discussed below as a mechanism for the effective collection and analysis of the data needed to develop the tools for improving educational success.

Talanoa

Talanoa is a traditional form of communication that is shared and is common across the Island nations of the South Pacific (Prescott, 2008). Although it is mainly oral, the term includes other mediums of communication. The term is, however, more than a simple form of communication and is underpinned by a number of entrenched values and aspirations (Halapua, 2003). Halapua suggests that *talanoa* is laced with cultural protocols and is carried out in an environment of trust, respect, cooperation and a willingness to reach a status of understanding and relationship. Halapua has successfully used *talanoa* as part of the process of bringing together groups and parties in conflict. In 2003, the *talanoa* process, facilitated by Dr Sitiveni Halapua, was successfully used to bring together the political opponents to the 2000 Fijian coup, the public servant strike in Tonga in 2005, and, as of recent, the National Committee on Political Reform in Tonga.

The suggested framework from this paper includes the use of *talanoa* to engage with Pacific students, their parents and communities. *Talanoa* with students and community will provide a dataset that will ensure that an understanding is reached between the students, parent participants and the researchers. In the Te Kotahitanga project, semi-structured interviews were used to capture the data. Traditional *talanoa* is more than an unstructured interview; it is a communication medium that is built on a cultural foundation (Prescott, 2008).

The second phase of the framework is the analysis and use of the data to develop tools and models that reflect the needs and demands of the student. It is important to recognise that the data will inform both the content and the method of delivery and engagement. As with the Te Kotahitanga initiative, the data was analysed in conjunction with existing research in Māori culture and traditions. The ETP (effective teaching profile) was, therefore, a product of the data collected from the student interview, existing literature, and indigenous Māori knowledge.

This paper does not provide a summary of the wealth of culture and traditional practices that may be used together with the data from the *talanoa* with students. However, they are an example of how Pacific cultures, practices and beliefs can be used in a Pacific pedagogical context. It should be noted, at this point, that the subtle differences in the Pacific cultures will need to be incorporated into the design and development process so that the models and tools may be different for each ethnic Pacific culture. It may, therefore, be worthwhile to consider dividing the tools and methods into generics and specifics, allowing for greater variety in its application.

Examples of Pacific practices to be used in conjunction with the *talanoa* data

The following are examples of Pacific events and practices that may be used in conjunction with the *talanoa* data. The eight components listed below are discussed in the context of how they may be used to enhance Pacific student educational success:

1. Event mentality
2. Relationship and reciprocity
3. Kinship and community
4. Learning through doing
5. White Sunday
6. Celebration
7. Respect
8. Church and Faith

1. Event mentality

Many Pacific Island cultures are characterised with an event mentality (Prescott, 2009). Prescott suggests that Tongan people are driven by event mentality. Events such as birthdays, weddings, church events and national celebrations provide a focal point for drawing together the efforts of the family and community towards the fulfilment of a single event. Individuals and groups alike commit significant time and resources to meeting the demands of these events. Given the power of these events, structuring education around this model may be a means for encouraging greater family and community engagement in education.

2. Relationship and Reciprocity

The importance and observance of relationships and reciprocity is shared among the Island nations of the Pacific. Coupled with the collective social identity, these countries also share and maintain healthy relationships, and nurture this through reciprocity. This has been the strength of Pacific communities, and also the source of why they have continued to hold together. Sharing knowledge and using it for the collective wellbeing of the community is likely to elevate education as a priority. Although this will not be new to many Pacific

families who migrated to New Zealand and Australia for education reasons, the notion is worth applying to a broader context to elevate the importance of education.

3. Kinship and Community

Pacific Island people share a sense of communal identity. This identity is centred on the family and community. Kinship and community are, therefore, important aspects of the individual's sense of being. These kinship and community links may also be used to leverage student educational success. Identifying individual student success as part of lifting the status of their kin is important. This may help Pacific students realise that their education journey is one that they do not need to face alone. This, in turn, will help lift their confidence as a capable and contributing member of their extended family.

4. Learning through doing

Much can be learnt through doing. Yet many academic subjects have not connected the learning objectives in the classroom to the real-life context and experiences that Pacific students relate to. Pacific children learn to fish and weave through observation, with hands-on experience with their siblings or parents. The context, illustrations, and practical application used in the classroom need to connect with the experiences of Pacific students. Developing materials and tools that allow this type of learning to occur is likely to resonate well with Pacific students.

5. White Sunday

White Sunday is an annual celebration for many church communities in the Pacific. The event will normally entail children memorising Bible verses and participating in biblically based dramas. The preparation for this event includes building the child's confidence to speak or sing in public, remembering the narrative or lesson to be delivered, and preparing the costumes and clothing to be worn on the day. Many of these celebrations are also accompanied by a feast that the community contributes towards. The preparation will normally involve the children, parents, siblings, aunts and uncles and grandparents together with the Sunday school teacher. The event is an example of how the family and community can work towards achieving a single goal. This same approach can be used in an education context provided the course or programme that the student is undertaking is embraced by the family and community.

6. Celebration

Celebrations are not uncommon in the Pacific. They are an opportunity to bring the community together and to recognise and reward achievement. While a number of families have started to recognise student achievement through celebration, it has not been included as widely observed celebration on the community calendar.

7. Respect

Respect and humility are encouraged qualities of the human character. Although some authors have identified this as a potential barrier to student learning, this need not be the case. The application of respect and humility in the education context can contribute positively to student success. Respect in the classroom that extends in both directions between student and

teacher, and student and student, is likely to create a more positive learning environment where students feel safe to share their views without fear of being ridiculed. The study by Ferguson et al. (Ferguson et al., 2008) that suggested students did not engage in the classroom through respect are possibly mistaking it for fear.

8. Church and Faith

Church and faith are an entrenched part of the Pacific students' sense of identity. Their faith is not only an important part of their identity, but a source of their confidence and perseverance. Schools that have adopted a secular learning environment unconsciously extinguish the students' sense of belonging, together with their source of endurance. Schools in New Zealand struggle with the competing religious divisions present in their community. As an alternative to taking a totally natural stance, opportunities to allow them to co-exist may result in improved student success across all ethnicities and beliefs.

Conclusion

This paper identifies a number of challenges facing Pacific students studying in New Zealand. The challenges facing Pacific students are not dissimilar to those faced by Māori students. The Te Kotahitanga initiative introduced in 2001 has paved a way forward for both Māori educational success, and other minority ethnicities studying in New Zealand. The paper suggests the adoption of a modified version of the process and framework used by the Te Kotahitanga project. The use of *talanoa* as the mechanism for collective and analysing the data will ensure that the developed outcome reflects the needs and learning requirements of the student. The cultures, values and beliefs of the Pacific nations are the final component of the framework. It is intended to provide the foundation upon which the specific tools and models are created.

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Exploring the Process of Educational Change in English Medium Senior Secondary School Assessment in Vanuatu

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Abstract

Educational change is ongoing and is generally aimed at improving teaching and learning, but usually comes with challenges. Scholars have devoted a great deal of research to investigate ways to minimise the challenges faced by such changes, but there is no one way of doing it all.

Vanuatu has experienced numerous educational changes since attaining political independence in 1980. However, official reports show that educational standards in Vanuatu are declining, which suggests that some recent educational changes may not have contributed to the enhancement of teaching and learning. This is, therefore, a concern that needs to be addressed.

This study sets out to explore this issue by investigating the process of educational change management in Vanuatu through the experiences, perceptions and expectations of Ministry of Education (MOE) officials, head of schools, and teachers, with specific reference to the change in the English medium senior secondary school assessment process. As well as contextualising the process of educational change within the Vanuatu education system, this study also examined educational change management from a global perspective in order to identify ways to improve such processes for the Vanuatu education system.

The data for this study were gathered by means of a qualitative case study approach which used individual semi-structured interviews and document analysis. The key findings reveal that the participants welcomed the change to the English medium senior secondary school assessment process, as it enables Vanuatu to have its own national certificate at this level. However, several factors appeared to have hindered the implementation process. Hence, participants' experiences, perceptions, and expectations were used to develop a proposed change management process framework for the Vanuatu education system, and to develop recommendations for improving the implementation of future educational changes in Vanuatu.

Keywords: Assessment, educational change, Vanuatu, change framework

Introduction

This paper reports on a study that investigates the process of educational change management as Vanuatu introduced its own nationalised English medium secondary school assessment system, a significant educational change in Vanuatu. Change within any educational context is complex and multidimensional given the numbers of personnel involved and the processes that are affected. Generally, change involves organisational learning, in which the education sector must learn and adapt through a process of acquiring, distributing, integrating, and creating information and knowledge among organisational members (Andreadis, 2009).

Educational change in Vanuatu is ongoing and it is often managed with consultants, foreign advisors and experts drafting policies for these changes, without central input from Ni-Vanuatu educators (Sanga & Niroa, 2004). These educational changes aim at enhancing learning and improving systems and practices. However, statistics show that the quality of education in general for Vanuatu is declining (Digest of MoE 2012; Ligo, 2011). This raises important questions such as, “What strategies are adopted to manage educational changes in Vanuatu?”, “Is Vanuatu prepared so that changes are effective when implemented?”, and “Are these changes successful, why or why not?” While these questions are significant and somewhat broad, they need to be addressed in order to help guide future educational changes in Vanuatu.

Vanuatu Research Context

The education system of Vanuatu is unique in the sense that it provides formal education in two languages of instruction, influenced by the two past colonial powers, Great Britain and France (Ministry of Education, 2009). Since independence, the country aimed to develop one overall system using two languages of instruction with a unified curriculum inclusive of all school sectors in order to achieve harmonisation in the education system. In 1986, the unified junior secondary education curriculum was produced, followed by the primary education curriculum in 1991 (Ministry of Education, 2010).

This study focusses on assessment in English medium schools only. After Vanuatu gained independence, the English senior secondary schools continued to use the General Certificate of Secondary Education (GCSE) examination managed, moderated and evaluated in England, for Year 11 students. It changed to using the Pacific Senior Secondary Certificate (PSSC) for Year 12 and the New Zealand Bursary for Year 13 in 1992. These were administered by Secretariat of the Pacific Board for Educational Assessment (SPBEA) in Fiji and New Zealand, respectively. In 2004, the New Zealand Bursary was replaced by the South Pacific Form Seven Certificate (SPFSC), which is administered by SPBEA. Some Anglophone schools have used the University of the South Pacific (USP) courses in Year 12 and 13 as their entry points to tertiary education, which is administered by USP (Ministry of Education, 2010; T. Tari, personal communication, October 25, 2012).

The current educational change in Vanuatu concerns nationalising the assessment system; that is, shifting the monitoring and evaluation process of senior secondary schools’ assessment to the Vanuatu Examination and Assessment Unit (VEAU). The change is one of the key priorities of the Vanuatu Education Road Map that was developed in 2009. This change began with the Year 12 internal assessments in 2011, where the Technology (IT), Biology and Agriculture subjects had their internal assessments administered by the VEAU. In 2012, all other Year 12 subjects’ internal assessments followed. It was planned that by 2013, both the internal and the external assessment components for Year 12 would be coordinated and facilitated by Vanuatu educational personnel.

The need to introduce the proposed change is understandable and supported in Vanuatu, but for best implementation it is important to ensure that the change process is conducted in the most appropriate way. The senior assessment process is a very important component of each student’s schooling as not only its outcome, but also its perceived credibility contributes towards the future lives of Ni-Vanuatu.

Literature review

Fullan (1991, p. 289) defines educational change as "learning how to do something new", and points out that successful implementation of educational change is a complex process with no clear solution. There are a variety of factors that may facilitate or inhibit educational change. Moreover, the process of educational change is a dynamic one involving interacting factors over time. Findings from a range of studies on educational change show that influencing factors often have different impacts in different settings (Fullan, 1991; Fullan, Cuttress & Kilcher, 2005). When more factors work against implementation, the process will be less effective. But when more factors support implementation, more change in practice will be accomplished (Lewin, 1951). However individual contexts may change the impact of any one factor.

Over the past 60 years, numerous scholars have contributed to our understanding of educational change, including Lewin (1951), Senge (1990), Hiatt (2003), Fullan (2007), and Hargraves and Shirley (2009). Although some focus on individual change and others focus on organisational change, all scholars agree that for successful change to be implemented there needs to be a systematic approach that allows enough time for the change to take place and be embedded. The success or failure in educational change is affected by more than the quality of materials, professional development or administrative support. Fundamentally, educational change fails at least partly because of the assumptions of planners and lack of solutions to solve substantial problems (Fullan, 2007; Fullan et al., 2005; Hargreaves & Reynolds, 1989). Most changes do not take into account the local context and culture, and this is very problematic (Fullan, 2007).

There are a large number of stakeholders within any national educational change initiative. Saario (1979) suggests that officials and administrators involved in a change process must be flexible and not tied to traditional patterns of behaviour and reactions. Principals are regarded as the pivotal point of success, so their professional learning about the particular change should be broadened (Fullan, 2007; Levin, 2008). Hoffman and Johnston (2005) add that principals spread innovation through their "principal network" (p.18). This suggests that once the change is clarified and understood, heads of schools are likely to use their networks to effect change. Fullan (2007) affirms that ongoing professional development for teaching staff is also important. If teachers are to help in capacity building, they have to engage in it themselves. If the involvement is to be productive, teachers are required to acquire new knowledge of the curriculum or new techniques (Durrant & Holden, 2006; Levin, 2008). It is important that stakeholders at all levels, including students and their families, are considered at an early stage in planning for change, in order that it is effective and successful (Carnall, 2007; Hall & Hord, 2011).

Research design

The research data was collected using qualitative interpretive approach involving a sample of eight participants. The participants included: two Ministry of Education (MoE) officials, two senior high school principals, and four teachers from senior high schools around Port Vila.

The participants were selected based on the important role they played in the initial change process. MoE officials played a key role in the planning of the change in assessment. Experienced heads of schools are the key agents in systemic change, so it was important that they be among the participants. Principals chosen had been present in their posts for over

three years. The teacher participants were those who had been personally involved in implementing the change in their schools. Those selected had been teaching the subjects selected for the research in the Year 12 level (Agriculture and Biology) for at least five years. The internal assessment process for these two subjects was the first to be nationalised according to the MoE change strategy.

Participants were interviewed using semi-structured interview protocol in order to be able to investigate the following research question:

What are the experiences, perceptions and expectations of MoE officials, school principals and teachers, with respect to the educational change process associated with the nationalisation of the English medium senior secondary school assessment in Vanuatu?

Findings and Discussion

From this study, we have been able to gain a sense of the experiences, perceptions and expectations of a range of Ni-Vanuatu associated with the change in English medium senior secondary school assessment in Vanuatu. Through thematic analysis, it has been possible to identify themes from the data that relate to how these practitioners viewed the educational change. As a caveat, it must be remembered that this study was completed at the beginning of the nationalisation of assessment in Vanuatu – and data reflects the participants’ thoughts and beliefs at that time.

Potential benefits of the change to nationalisation of assessment

Participants in this study spoke positively of this change to nationalise the Vanuatu assessment system and identified a number of benefits. For example, one person commented:

“I think it is good as it helps people (teachers and educationist) move up the ladder as you can already see. We can have someone from Vanuatu actually writing the examination paper that students in senior secondary school will do. It is also good because it might be in simple English and the paper might be written according to what is reality in Vanuatu.”

The benefits to both staff and students were identified, including the possibility of higher validity in assessment, given that assessment tasks could better mirror what was taught in the Vanuatu context.

Key benefits that were identified were:

1. Increased teacher morale and improved general skills and knowledge.

The professional development that took place during two summer holidays (2011 and 2012) helped to improve teachers’ assessment practices. Similar benefits have been found in other studies (Carnall, 2007; Earl, 2013; Levin, 2008). Professional learning and development (PLD) is rare for many teachers in Vanuatu, so being able to experience PLD was particularly appreciated. In particular, the professional development on formative assessment helped teachers more fully understand their role in assessment, and this has the potential to be transferred to their general pedagogy.

2. The development of an assessment policy by the Ministry of Education.

Participants were hopeful that this will ensure schools are more consistent in their approach to assessment, providing confidence to families and teachers.

3. The likely amalgamation of the Anglophone and Francophone curricula.

This amalgamation is in alignment with one of the objectives of the Education Master Plan (MoE, 1999). Participants in the study saw this as beneficial

4. Increased opportunities and new professional roles

Opportunities will now exist for teachers to step into new roles such as examination writers, moderators and so on. Hargreaves (1993) points out that teachers and schools are often more willing to take on responsibility if they are able to see it as an opportunity to make a real difference. Therefore, what is done in this regard is very rewarding for Vanuatu senior secondary teachers.

Elements that assist or restrict educational change in Vanuatu

In order for the benefits listed above to be realised this study found that a number of factors needed to be considered. In this study the participants identified some barriers to the change process, and from these we can focus on what to do better in order for a successful educational change process.

Take account of prior knowledge

This educational change provides an example of a process which did not fully take account of the prior knowledge of those involved in it. As highlighted in literature, the success of any educational change is at risk unless the leaders of the change are certain that those charged with bringing about the change have the appropriate level of prior knowledge to be able to perform what will be required of them. It is, therefore, vital, with any desired educational change, that a check is made for the existence of the required prior knowledge; this serves as the starting point for understanding change (Carnall, 2007; Levin, 2008). In this study, teachers did not feel that they had enough relevant professional knowledge, as one teacher described how,

“When I came back to Vanuatu to teach, ah... I don’t recall any training for me on how to do assessments for senior secondary school. In the past, there has been some training, but when I start teaching, there’s never been any training, just at the beginning of this year, the South Pacific Board of Educational Assessments came over to Vanuatu and just introducing us to the thought of nationalising the Pacific Secondary School Certificate.”

If the required level of prior knowledge is not present, then the leader of the change must attend to ensuring that it is gained through professional development before the change commences. Because this did not happen for the change process involved in the assessment system, teachers and others felt ill-prepared to work with the new assessment system.

Ensure a positive outlook

A number of changes in the Vanuatu education system have been implemented since independence. Although well intentioned, some of the changes did not suit the local context (Niroa, 2004) and somehow failed. In turn, this meant that participants in this study approached this educational change with concern. As one teacher reflected on his past experiences of educational change in Vanuatu,

“I think they were not successful because the changes were mainly trial and error. They make a change; the heads of schools and teachers try to implement it then another change comes in.”

Teachers need to resource themselves well and know what they are expected to be part of, in order to commit themselves fully (Carnall, 2007; Fullan, 2007; Levin, 2008; McEwan, 2005). Thus, the development of a positive outlook amongst the key participants, so as to ensure they each have a positive commitment and attitude, is essential in any change process. The responsibility of a nationalised assessment systems caused concern and fear from some participants, given their earlier experiences.

Pre-implementation planning

Careful pre-implementation or ‘initiation of change’ is vital in a change process. Professional learning for personnel, the presentation of clear visions and goals of the change, an assessment of the change, and its problems are all part of the strategic planning which should be done in the pre-implementation stage of a change process (Fullan, 2007; Hargreaves & Shirley, 2009). Whether the previous educational changes in Vanuatu were well planned was quite difficult to assess, but from the participants’ perspective, comprehensive planning was often not apparent and this made them anxious about what might happen with this very important change. A lack of appropriately experienced or prepared personnel at the VEAU during the initial implementation period perhaps explains the poor pre-implementation stage of the change process observed by participants in this study. Change processes are more achievable if all involved are aware of what is planned and understand this plan well (Hiatt, 2003). However, most of the teacher participants in this research acknowledged that the goal and anticipated process for this particular change were never widely publicised.

Balanced implementation

The provision of a balanced implementation plan is yet another important part of the change process. This is to do with attending equally to both the process and the people (Bridges, 1995). Transition is more important than change. If a person does not really understand what the change is all about, it is likely that the person will not let go psychologically and will resist the change, which may then contribute to the likely failure of the change (Bridges, 1995; Carnall, 2007; Leigh, 1988). If the transition of the teachers and principals involved in this change was managed properly, the implementers would be more confident about the change, but this study found them to be concerned and unsure. A more balanced focus on the persons and the process of the change would help build up the necessary level of trust (Bryk & Schneider, 2003) amongst the various stakeholders with the VEAU, which will lead to an effective adoption of the change.

Stakeholder involvement

The involvement of stakeholders is vital in any change process (Fullan, 2005; 2007). In this case of educational change in Vanuatu the stakeholders referred to were: parents, students, teachers, head of schools, and MoE officials. The study showed that parents, students, teachers and heads of schools did not necessarily feel fully involved in the planning process for the change in the English medium senior secondary schools assessment or nationalisation.

For example, as suggested by one participant,

“The students and parents are not aware of the current change. The change is only communicated to us teachers.... So, parents and teachers do not know that nationalisation is already starting.”

As far as MoE officials were concerned, this change was so rapid that it significantly increased their workload, but their full involvement was essential. This is consistent with Saario (1979), who confirms that officials and administrators become catalysts for change as they generate initiative in the system. However, change processes need to involve all stakeholders right from the start (Fullan, 2007; Duke, 2004; Hargraves & Shirley, 2009).

Change Management Process Framework for Vanuatu education system

Based on the findings from this study a Change Management Process Framework has been developed to encapsulate the key change management for the Vanuatu education system.

This framework summarises key considerations that are identified as important for successful change management in the Vanuatu education system. These are considerations of: Prior Knowledge, Positive Outlook, Pre-implementation Planning, Balanced implementation, and Stakeholder involvement, as discussed in the earlier section. Given that this framework is derived from empirical evidence, we argue that careful consideration of all of the factors in the framework by implementers of change will mean that a smooth educational change is more likely in Vanuatu. Each one of these factors needs to be carefully considered, as if even one is overlooked, there is likely to be problems in the implementation of the educational change.

Conclusion

The research aimed to explore the perceptions and experiences of MoE officials, heads of schools and teachers of the educational change management processes, particularly, the English medium senior secondary school assessment change. The findings revealed that there were strengths and weaknesses in the change management process implemented in the assessment change in the educational system of Vanuatu. It is hoped that the Change Management Process Framework derived from this research will be useful to all stakeholders involved in educational change and will be used to inform any future change processes in the Vanuatu educational system.

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The Potential of Professional Learning Communities (PLC) for Teacher Learning in the Community High Schools (CHS)-Solomon Islands

Kerryn-Sogha Galokale Futaiasi

Abstract

The rapid growth of community high schools throughout the Solomon Islands since the 1990s has put pressure on the government to provide trained teachers, together with school curriculum materials and resources. An effective approach that could be used to support on-going teacher learning in schools is the establishment of professional learning communities. This study explores the pre-existing ‘cultures’ of teachers within two community high schools, to illuminate the formal and non-formal learning experiences of teachers, which could be built upon, to develop effective professional learning communities that would lead to quality teacher learning. This study draws on qualitative research methods and uses a case study approach. Ten teachers in two community high schools participated in semi-structured interviews and focus group discussions. A reflective journal was also used to gather data. The key findings of this research include the potential teaching and learning experiences of the teachers in these two community high schools, which could be further improved, to develop effective professional learning communities. Shared values and norms, collaborative practices and structures, reflective practices, and a focus on student learning lend support to professional learning communities. The findings also highlight existing obstacles and hindrances to teachers’ learning experiences and practices that need to be addressed, for professional learning communities to be established successfully in these schools. This study suggests six recommendations for the establishment of professional learning communities in community high schools which include: shared responsibilities, sharing information and ideas, active leadership roles, frequent departmental staff meetings, staff devotions, and support from all stakeholders.

Introduction

In 2010, the head of the English department at my previous school, Crystal School (a pseudonym is used for the community high school name), drew up a professional development (PD) plan for English teachers (including myself) in my school and our sister-school. It was only a two-hour programme from 3-5pm after school. The focus of this PD programme was to encourage the English teachers to collaborate and share our teaching methods, for enhancing students’ learning. This PD programme was implemented because in 2010, many English teachers were beginner teachers who had just started teaching, and there was a need for experienced teachers to mentor them. The facilitator of the PD programme was the head teacher of the English department with seven years teaching experience. During the programme, all participants shared a teaching method and a student learning activity, which we had taught in our English classes. Subsequently, there was no further discussion (due to limited time) and the facilitator summed up the PD programme. However, during my three years teaching in that school, this was the only PD programme of this sort facilitated for staff PD.

Overall, this PD programme was largely ineffective in facilitating any long-term sustainable change at Crystal School for the English teachers. The question of why this PD programme was not effective has been in my mind since attending the PD programme. Further queries about this were triggered when I undertook postgraduate study in 2011. One of the papers,

263701 Enhancing Teacher Learning, provoked serious consideration about how best to support teacher learning, especially the notion of a professional learning community (PLC). I believe that PLCs may be one possible approach that might help to develop and support teachers' PD and PL in Solomon Islands. Furthermore, I realised that there were several issues to the PD programme offered in the past to Crystal School teachers and their sister-school; and the establishment of PLCs in these schools might help to address these issues.

Briefly, the issues are as follows:

- Meeting times were not held for the teachers, following the first meeting.
- The limited time of two hurried hours for this PD programme provided minimum opportunities for the teachers to hold professional conversations with each other.
- Mentoring was not put in place for the beginner teachers following the PD programme and generally teachers work in isolation.
- Minimum support from the school principal when the head of the English department approached him for financial support.
- Expertise was not available due to financial constraints on the school: and an external expert, who was sought to help with the PD programmes, could not attend.
- An evaluation was not undertaken to determine whether the programme was effective for the teachers (or not): or what improvement was needed for future PD programmes.

Through undertaking research in this area, I believe that the study's findings will make a significant contribution toward addressing the issues relating to the lack of PD programme, and also help school leaders to run PD programmes that meet the needs of each teacher.

Research Question

The research question that guided this study is:

What are the formal and informal learning experiences of teachers in Community High Schools that may provide the basis for developing professional learning communities for teachers' learning?

Thus, this study has explored the pre-existing 'cultures' of teachers, especially in the CHSs, to illuminate the current learning experiences of the teachers. Of interest are the formal and non-formal learning experiences of teachers, together with other significant contextual factors related to CHSs, which could be built upon, to develop effective PLCs within schools in the future, in addition to identifying those factors that may be constraints to the development of PLCs.

What is a Professional Learning Community?

It is generally agreed that, within an educational setting, a PLC is a group of school teachers and administrators who continuously seek and share their lifelong-learning, whilst critically interrogating their practice. And they act on their learning, to promote growth and development within their school (Stoll, McMahon, Wallace, & Thomas, 2006).

Therefore, it can be expressed that a PLC is an organization where teachers and administrators of a school share common values and norms, engage in collaboration, involve themselves in reflective dialogue; and actively interact with each other to promote the

potential of all members in order for new knowledge of teacher learning to be created, supported, and sustained.

What are the benefits of Professional Learning Communities?

Poskitt and Taylor (2007, p. 1) noted that, "...the ultimate purpose of PD in education is to impact on the learning of teachers and students, given that teachers and their practices have the most effect on student learning."

Studies have shown that in schools where staff are engaged with each other in PLCs, immense benefits were experienced by the staff and the students:

1. Reduction of teacher isolation (Snow-Gerono, 2005).
2. Increased teacher development (Wong, 2010).
3. Shared responsibility for student success (Owens, 2010).
4. Less experienced teachers grow professionally (Edwards, 2012).
5. Professional relationships formed (Boyd, 2005).
6. Increased leadership development (Owens, 2010).
7. Improved students' learning (Poskitt, 2005).

Research Methodology

In attempting to establish effective PLCs for teacher learning in schools in the Solomon Islands, a qualitative research project in the form of a case study was undertaken. Case study was chosen to explore the formal and informal learning experiences of teachers in two CHSs, which can provide the basis for the development of PLCs within these schools. Data was collected using semi-structured interviews, focus group discussions and reflective journals as the research methods. Subsequently, data was recorded and transcribed, followed by analysis and finally, the write-up of the report.

Selection of Schools and Participants

Two CHSs, in the Solomon Islands were selected as the sample for this research project. Sunshine Community High School (SCHS- a pseudonym is used for the community high school) was selected as one of the schools because it is in Honiara Town and it is a day school. In addition, due to the limited time of my research, SCHS is located at a central location that I could easily travel to, to undertake my research. Roadway Community High School (RCHS- a pseudonym is used for the community high school) was selected because it is outside Honiara City, located in a very remote area, and is a boarding school. These two CHSs were chosen because they also operated under different Education Authorities: SCHS operates under the Honiara City Council Education Authority, and RCHS operates under the South Seas Evangelical Church Education Authority. These two schools provided different contexts for me to study and to understand their formal and informal learning experiences.

In RCHS, four teachers volunteered to participate and in SCHS, six teachers voluntarily participated in the study. Therefore, the only criterion in the selection of participants in the study was that they were CHS teachers and other factors, such as gender, age, qualifications or teaching experiences, were not considered.

Findings and discussions

While some research has already made helpful contributions into issues within the Solomon Islands' education (Alcorn, 2010), this study seeks to contribute further useful information on teachers' learning experiences in two CHSs, which can be built on when developing effective PLCs for teachers' PL in the future. The notion of a *professional learning community* is new in the Solomon Islands context, and this study has been designed to address the gap in the literature in relation to developing a PLC for teacher learning within a developing Pacific country. In this case, the Solomon Islands. Four themes were identified through thematic analysis of the data.

1. *Shared Values and Norms*

A school's vision statement is very important, because a vision is one way to achieve the inclusion of values within a school (Huffman, 2003). The school's vision is based on a set of values that answers basic questions about the school's purpose of education, and how educational programmes should be carried out within the school (Boerema, 2006). It was shown in the study's findings that each of the CHSs has a vision statement, which potentially directs, to the teachers, the shared values which they need to uphold together and engage in during day-to-day actions in relation to all of their students' learning. These shared values include: meeting students' religious needs, teacher's commitment to meet the learning needs of their students, and teamwork. As one teacher mentioned:

"...The vision statement gives guidelines to us as to what we have achieved and what we have not achieved. That will help us to promote quality education for our pupils and communities around us..." (Dennis- pseudonyms are used for teachers, SCHS)

There are also some hindrances to teachers' shared values, which may hinder teachers' working together to provide quality education for their students: a lack of support from stakeholders, teachers' differing beliefs and values, teachers' needs unmet, and change of leadership.

Despite the hindrances, shared values can potentially bring teachers to work together, which is relevant to the establishment of PLCs (Huffman, 2003).

2. *Existing collaborative Practices and Structures*

Collaboration is an effective process in PLCs in which teachers engage together to question, exchange, and reflect on their classroom practices (Lujan & Day, 2010). The study's findings reveal that teachers in these CHSs engage in certain sharing, especially when sharing their teaching difficulties with other teachers in their schools who face similar teaching difficulties. When they talk about their teaching difficulties with other teachers, it helped them in their teaching and learning practices.

The study's findings also reveal that those teachers, who engage in sharing their teaching and learning difficulties, find it comfortable to share with teachers with whom they share the same interests and experiences. As one teacher expressed:

"He (a teacher in his department) is the only one I am close to because we have the

same interests. We smoke and share betel nut and most times we are together, so I find it easy to share my ideas with him.” (Peter, RCHS)

The study’s findings also show that the CHSs have working teams, which they refer to as school committees. The presence of existing structures of working groups within these two schools is a potential culture of collaboration, which can be further developed, to create PLCs. Collaboration is argued to be a powerful tool for use when working within teams or groups (Kilpatrick, Barret, & Jones, 2003).

In addition, the study’s findings reveal that most participant teachers have had the opportunity to attend workshops and these teachers indicated that this benefited their teaching practices, in addition to the learning of their students. As one teacher expressed:

“It was more on the practical side of my subject and I learnt many new ideas that got me to think about what I am supposed to do and what I am not supposed to do. It was very helpful for me.” (Luke, SCHS)

However, the sharing of teaching and learning practices may not be easily practiced by some teachers within these two CHSs, and a teacher working in isolation is a common practice in these schools. Teacher isolation may be situated with an individual teacher or it may be situated within a school structure (Sindberg, 2011). The study’s findings have shown three possible reasons why working in isolation is a practice within these two CHSs: lack of personal and collegial relationships; differing cultural values, beliefs and practices; and subject hierarchy. As two teachers expressed:

“S/he keeps to him/herself and doesn’t open up to sharing and discussing.” (Luke, SCHS)

“Custom...it makes it difficult for us to share because it is taboo for cousins (a cousin brother and a cousin sister) or in-laws (sister in-law and brother in-law) to sit together and share.” (Jane, RCHS)

It is, therefore, important to note that for PLCs to be established effectively within the CHSs, teachers need to engage in collaborative practices. Collaboration has positive outcomes for teachers and it ultimately leads to students’ improved learning (Konza & Maloney, 2011).

3. Reflective Dialogue Inquiry Practices

Reflective dialogue inquiry is teachers becoming aware of their work as teachers, and where teachers have the space to express and reflect on their viewpoints and ideas in regards to teaching and learning, in addition to having conversations about students and teaching and learning (Owens, 2010). The study’s findings show that only a few teachers in these two CHSs have engaged in reflective practices, while most the other teachers admit to not having the opportunity to engage in reflective practices. It is evident in this study that those teachers, who have engaged in reflective practices, either could think about their work after their classes, or they reflect on their day’s teaching and work when they return to their homes. As one teacher expressed:

“...I don’t usually reflect about my teaching, but when I go back home, sometimes I think about my day’s lessons.” (Jane, RCHS)

In addition, Sindberg (2011) found that the unique culture of teaching allows for discussions about everyday issues and general complaints about students or the school, but for teachers to talk to each other about teaching is just not practical. Similarly, the study's findings reveal that only one teacher mentions sometimes having the opportunity to discuss with his colleague if a problem arises during a lesson for either of them. According to Poskitt and Taylor (2007), only a few teachers have the opportunity, time and skills to engage in professional conversations, even though professional conversations provide useful opportunities for teachers to acquire new knowledge.

However, despite only a few teachers in this study currently engaging in reflective practices, the development of PLCs in these two CHSs can provide these teachers with opportunities, time and skills for them to practice reflective dialogue inquiry (Snow-Geron, 2005).

4. Focusing on Student Learning

Teachers' practices focusing on improving student learning should be the ultimate purpose and aim of PD in education (Poskitt & Taylor, 2007). The study's findings reveal that focusing on student learning seemed to be important for most teachers. The study's findings show that the most common student activities that these teachers provide for their students are providing notes and information on topics for the students, followed by questions and tests relating to the covered topics. So, if PLCs are developed within these two CHSs, teachers will not only be providing information together with tests for their students, but they will also be able to test new approaches for continuous improvement for their students (Darling-Hammond & Richardson, 2009).

In addition, assessing their students' work is relevant to identifying what teaching practices work, and why and whether students have learned or have not learned the relevant curriculum (Reichstetter, 2006). In assessing students' work, the study's findings reveal that most the participant teachers usually collect their students' work, mark it, and then return the marked work to the students. Furthermore, the study's findings show that most teachers do not usually show their students' work or results to other teachers, but when they could do so, they generally share with other teachers about their students or they ask other teachers about certain students. As one teacher commented:

"I don't usually show my students' work to other teachers...but I usually ask the other teachers when we talk together about the performance of a particular student in the other teachers' subject." (Peter, RCHS)

The findings of the study also reveal some difficulties these teachers encounter in their teaching, which also affect the learning of their students. This study has identified five hindrances that teachers face which include: lack of teaching resources; poor communication skills between teachers and administrators; teacher's lack of understanding of their subject syllabus; unawareness of sharing practices; and less time to engage their students in learning activities and to work with other teachers.

Although this study's findings reveal barriers to effectively focusing on student learning in these CHSs, PLCs have the potential to provide support and guidance for teachers to integrate formative assessment into their teaching practices, in order to promote student achievement (Reichstetter, 2006).

Conclusions

The formal and informal learning experiences of teachers in RCHS and SCHS could provide the basis for developing PLCs for teachers' learning within these schools. Both CHSs are guided by shared values and norms on what is important for them as teachers in the schools, and what they want their students to achieve. The sharing of values and norms is a core characteristic of a PLC, which need to be shared by all members. The study also found existing collaborative practices and structures, which are potential areas that could be improved and developed further to establish PLCs. Furthermore, some teachers are already engaged in some type of reflective dialogue inquiry, which is one of the bases for developing a PLC. These teachers have also recognised the importance of a focus on student learning, and that this should be the ultimate goal in their teaching and learning. Together, with these potential teaching and learning experiences of the teachers, are the existing hindrances to teachers' learning experiences and practices that these CHSs need to address in order for PLCs to be established successfully in their schools. Thus, schools (such as RCHS and SCHS) throughout the Solomon Islands have the potential to develop PLCs for teacher learning and purposely, for students' improved learning and achievement. Start doing!

Recommendations

Six main recommendations have emerged from the study's findings, in regards to ways for improving teacher learning and for establishing effective PLCs in the RCHS and SCHS.

1. Shared responsibilities

Shared responsibilities would encourage teachers to collaborate effectively and guide them towards working together.

2. Sharing information and ideas

Teachers need to share their knowledge, in relation to their practices and information and ideas about their teaching and learning experiences.

3. Active leadership role

CHSs need leaders whose role is to work closely with teachers and provide coaching or mentoring in relation to their teaching and learning practices.

4. Frequent departmental and staff meetings

There needs to be departmental and staff meetings to encourage teachers to share and talk about their teaching practices and learning experiences.

5. Staff devotions

Staff devotions could encourage teachers to collaborate and work together as a team of teachers in their school.

6. Support from all the stakeholders

These CHSs need the support of parents, churches, communities, authorities and the government to work with them, in order to accomplish their vision statement which daily guide their school developments and plans.

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Economically Empowering Rural Women – Building a Culture of Savings through Education, West AreAre, Malaita Province, Solomon Islands

Alice Aruhe‘eta Pollard

Abstract

When we ask “Education for What”, we tend to equate education with formal schooling. This paper, focused on the initiatives of the West AreAre Rokotanikeni Association (WARA) to provide financial literacy to rural women throughout Solomon Islands, highlights how education can be contextualised. WARA’s case study demonstrates that education is relevant and empowering for rural women too. WARA is inclusive in nature and is founded on principles of strong leadership, good relationships, basic education, common sense, trust, flexibility, and our ordinary way of life. It shows that in diverse developing countries, such as Solomon Islands, what matters is education for all of us: education that cuts across gender boundaries, the rural/urban divide, the lower/higher education divide, and the generation divide. It is education that is relevant and provides for all.

Introduction

This is a case study of a successful story of a rural-based women’s association, West AreAre Rokotanikeni Association (WARA), South Malaita Province. WARA has more than one thousand financial members, representing thirteen zones, one of which is an urban zone consisting of West AreAre women residing in Honiara. WARA started in October 1999, in response to the many socio-political and economic issues experienced in the rural communities by women. WARA savings programme was started in September 2006.

Context

WARA covers the areas from Afutara village to Maka village and two provincial wards: wards 24 and 25 of Malaita Provincial Government Structure. The main mode of transport in West AreAre is by motorised canoes as there is no access to roads except for zone 1 – Hauhui villages that have road access to Auki, the provincial centre of Malaita province. There is one airfield at Afutara, but it has been non-operational in the last few years. Communication with rural communities has been greatly improved due to the installation of Telekom and B-mobile towers. Shipping to the villages has been irregular and poor. There are a few Community High Schools and a few clinics. There are no banking facilities or services.

The VAKA Pasifiki Theme – Education for What Revisited

In such a challenging context as above, how can education be meaningful and appropriate? How can the illiterate rural women of AreAre embrace education as a tool for empowerment for them and their children and families? How can the confidence and comfort of women with low levels of functional English and lack of experience with formal financial systems be measured? How can those women be confident to open a bank account or let alone use electronic devices?

WARA – Building a Culture of Savings

WARA was determined to unite and stand together with one vision and one voice as women of West AreAre to address some of the socio-cultural, political, and economic issues in a way that was appropriate, useful, and meaningful to them in their own context. Women identified their priorities, and led the way for other rural women in Solomon Islands. Among many other programmes, economically empowering women was their priority. This included financial literacy training, savings, business development training, loan scheme, and managing small businesses.

Under the EU-Micro Project in 2002, funds were made available for women to do basic business training in the rural communities. Women were taught how to do basic costing and pricing of their goods, marketing, recording, and profit making. In addition, a small amount of money was provided as seed money to set up a revolving loans scheme for women.

In 2004, the Revolving Fund Scheme was launched and rolled out by the thirteen zones with an equal allocation of SBD\$3,000 per zone except for Honiara and Auki zones, who were allocated \$1,500 each. Each of the zone executives was trained to screen and administer the loans with limited financial management skills. With the small pool of money available for loans, women were able to apply for small loans to finance their small projects. The projects include baking, canteens, sewing, dyeing lava lavas, copra making, timber milling, cocoa growing, and marketing of cooked food, garden produce, and marine resources. By 2007, the total loans transacted by all zones were SBD\$100,000.

In September 2006, WARA launched its savings scheme which offered basic financial literacy training. The financial literacy training covers topics such as differentiating between most important things, less important things, things that can wait, goal setting, budgeting, savings, and loans. Financial literacy training is very crucial in this day and age where money is needed for education, health, transport, livelihoods etcetera. Building a culture of savings in Solomon Islands is also necessary as people spend money on many unnecessary items rather than saving money for most important things.

At the first savings collection session in 2006, WARA collected just about SBD\$8,000. By 2015, savings had increased to more than a million Solomon dollars. The impact of the financial literacy training and savings has empowered women to manage personal and family finances, handle money, and perform banking services

Recognising the economic activities that had already transpired through the work of WARA and other organisations in Solomon Islands, the Central Bank of Solomon Islands convened a National conference on financial inclusion in November 2010. Following this conference, the Central Bank of Solomon Islands established a National Financial Inclusion Taskforce (NFIT) to organise and coordinate financial inclusion efforts and track progress against set goals

NFIT paved the way for reaching rural women/informal sector with financial literacy training and banking services. NFIT developed nine Key Result Areas (KRA), one of which is KRA 2, which highlights the areas of increasing women's participation in financial literacy and accessing affordable financial services in Solomon Islands. The key objective of KRA 2 focussed on efforts to have at least 30,000 new women educated, and actively participating in the financial inclusion programme by 2015.

This policy framework gives support to the work of WARA. More women and girls continue to save with WARA. Not only that, WARA has extended its work to other parts of Solomon Islands such as Western Province, Shortland, Central Islands Province, Guadalcanal Province, Honiara, and parts of Malaita. As this paper is being compiled, more than three thousand rural women are saving in the rural areas, using the WARA model.

Challenges

There are a number of challenges involved in running the programme. These include

- Huge personal costs for those providing the training
- Volunteerism
- Lack of available funds for community reach out
- Poor infra-structure
- Low literacy
- Constant fundraising

Benefits

Despite the challenges involved, the following achievements have been observed.

- Accessibility – women can now access banking services through the savings scheme
- Banking Language – rural women understand basic banking terms such as deposit, withdraw, interest, and balance
- Rural women can touch, deal with, and manage cash
- Rural women have savings passbooks
- Rural women engage in income generation or small businesses
- Rural women are managing personal and family finances
- Rural women own and have control of their savings

So, if we ask the question, “Education for what and for whom”, WARA’s case study demonstrates that education is relevant for rural women too. Education is an empowering tool, and strongly linked to financial literacy and economic empowerment of rural women. It is Education for All of Us that matters: education that cuts across gender boundaries, education that cuts across the rural/urban divide, education that cuts across the lower/higher education divide, and education that cuts across the younger/older generation divide. It is education that is relevant and provides for all.

In conclusion, WARA is inclusive in nature and is founded on: strong leadership, good relationships, basic education, common sense, trust, flexibility, and our ordinary way of life.

Photos



Women using motorised canoe to collect savings three times a year



Balancing and collecting savings in the rural communities



Celebrating reaching a million Solomon dollars 2015



Part of above celebrating



Conducting a financial literacy workshop in Zone 12, Uhu, 2012



Young WARA girls ready to garland the guests at the 2015 celebration event



Vaka Pasifiki Education Conference