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The motif on the cover is based on a nineteenth century carving of a ship's prow from Choiseul, Solomon Islands. To *Directions: Journal of Education Studies*, it signifies forward movement.

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Roles and Responsibilities of Parents in their Children's Primary School Education in Solomon Islands

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The University of the South Pacific

Abstract

Parental involvement in their children's education has become a priority issue for governments and policy makers. The Solomon Islands Government also recognised its importance and included the matter in its Education Strategic Framework 2007 – 2015. This study investigated the views of parents on their roles and responsibilities in their children's primary school education in Solomon Islands. The research data was gathered using qualitative methods, specifically, a semi-structured interview guide to facilitate discussion with the participants. This study found that the parents were actively involved in their children's education by providing food, verbal encouragement and school requirements, teaching family values, and direct participation in school activities. However, some factors were identified that inhibit parental involvement in their children's education, including a lack of on-going communication from schools about children's learning progress and school developments, and parents' financial constraints. The study found that parents are willing to help as volunteers at school, but schools have to advise them on how they can help.

Introduction

The parental involvement in children's education is significant in a number of ways. However, the majority of studies on parental involvement in children's education were documented only with the experiences of parents and schools from developed countries such as the United States of America (Downey, 2002; Finders & Lewis, 1994; Glanz, 2006; Mapp, 2003; Stacer & Perrucci, 2012). There is very little literature on the topic of parental involvement in the small island states such as those in the Pacific region, and in particular from Solomon Islands.

This study investigated the views of six parents on their roles and responsibilities in their children's primary education in Solomon Islands. The research data was gathered using qualitative methods, specifically, interviews using a semi-structured interview guide to facilitate discussion with the participants. The research fieldwork was conducted in the Solomon Islands with six parents from six different primary schools (four parents from Honiara City schools, and the other two parents were from two rural community schools).

Background of the Study

In Solomon Islands, changing educational needs have posed several challenges for the government. One issue is that increased population growth has seen a rise in demand for more secondary schools (Memua, 2011). To meet these demands, secondary schools are added to existing primary schools and they are called Community High Schools (CHS). The structure of leadership in the CHS consists of the Principal, Deputy Principal, for the secondary level, and the Head Teacher and Deputy Head Teacher for the primary school level. The schools are built and expected to be managed jointly by the school leaders,

parents and the surrounding communities, and assisted by Educational Authorities (EAs). However, this was not the case as found in 2007 during the Solomon Islands Provincial Planning workshops where education officers and school leaders were participants (MEHRD, 2007), and again found by Sisiolo (2010) in his research on educational leadership in Choiseul Province, Solomon Islands. In both cases, a lack of parental and community support for children's learning has been reported. Sisiolo (2010) stated that "the barriers to community active participation in schools are still to be researched in Solomon Islands" (p. 29). Therefore, this study aims to address that research gap, with a focus on parents' views on their roles and responsibilities in primary education.

Literature Review

Parental Involvement in Education

Parental involvement in education is when parents participate in meaningful communication with the school, and provide support by being involved in their children's home and at school learning (Anfara, 2008). They are the "first teachers of their children" (Berger 2008, p. 137). Parents are the first people to help children learn at home and join with the school to improve their children's educational performance.

Three constructs have influenced parents' involvement in the children's education (Hoover- Dempsey & Sandler, 1997). The first is, 'parental role construction' (ibid, p 9) which outlines parents' belief about their duty to be involved in their children's education. Second, it is the influence of 'parents' sense of efficacy' (ibid) for helping their children to succeed. It is a belief that involvement in their children's education can have a positive impact in their children's learning. Third, 'parents' involvement by invitation,' (ibid) which means that parents only become involved in their children's education when the school or their children have invited or requested them. This review suggested that parental involvement can be shaped by these three types of constructs because each is 'composed of specific sets of belief, experiences and behaviour that serve to position parents,' (Hoover-Dempsey & Sandler, 1997, p. 9).

A review by Hoover-Dempsey, Walker, Sandle, Whetsel, Green, Wilkins, and Closson (2005) on the constructs identified in Hoover-Dempsey and Sandler's (1997) model of the parental involvement process have recognised two realities about parental involvement. First, a lot of parents do not need encouragement to become involved because they are already involved in their children's education, however, they do need some incentives for further involvement (Hoover-Dempsey et al., 2005). Secondly, parental involvement tends to drop when students reach later middle school and high school years. The key finding of this review was that parents' decisions to become involved in education are influenced by the schools' management. Therefore, it was suggested that in matters of dealing with parents, 'schools may take steps to enhance parents' active role construction and sense of efficacy for helping children learn and enact practices that support school teachers,' (Hoover-Dempsey et al., 2005, p. 123).

Parental involvement not only varies in type but also degree due to barriers. A Canadian study based on a survey of parents of intermediate year students found that parents, although they wished to be involved, were only moderately involved in their children's education because of time constraints and conflicts with their work schedules (Brock & Edmunds, 2010). Interestingly, this Canadian finding echoes Stacer and Perrucci's (2012) analysis of a parent and family involvement survey of white, black and

Latino parents in America in 2003. The study showed that white parents were more involved in school programmes than minority groups because parents in minority groups spent more hours at work (ibid). However, the analysis further revealed that the black parents were more involved in the community activities such as attending church than the white and Latino groups. The black and Latino parents were more comfortable interacting with their children at home than at school. This highlights the importance of schools making connections with home so that parents may become comfortable and familiar with their children's schools (ibid).

Parental involvement at home is more productive than at school because parents play an important role at home in preparing children to meet the schools' demands (Downey, 2002). The study suggested that children's learning processes begin at home with parents and other members of the family. However, effective learning at home is 'shaped mainly by time constraints based on employment situation, family size, and perhaps family income,' (Stacer & Perrucci, 2012, p. 343). Therefore, parental involvement at home is more productive, but this depends on the availability of parents' time.

The Importance of Parental Involvement

There is significant literature on the importance of parental involvement in their children's education which helps to improve learning outcomes for students (Berger, 2008; Downey, 2002; Epstein, 2007; Glanz, 2006; Hornby, 2000; Sharma, 1993). A case study carried out by Dorovolomo (2007) on the collaborative experiences of a secondary school principal on Choiseul Province, Solomon Islands, in engaging the community have found that parental involvement in their children's education has improved children's learning and their end of year exam results. The study found that there was improvement in children's learning because of the parents' continuous participation in school activities. The study also revealed that participation in school activities increased parents' awareness of the school system. It also provides the understanding that being involved was important because it signalled to their children that they care and support the children's effort at school. Parental involvement is a motivational tool for the children (Brock & Edmunds, 2010).

In addition, involving parents in school management is important as it helps build a positive relationship between the school and the parents. As Sharma (1993) states in her article on the Ethics of Parental Participation in School Management in Fiji, parental involvement in 'school management encourages parents-school relationships through dialogue, mutual consideration of opinions, shared leadership and partnership in decision-making.' (p. 61). It further suggested that a higher level of parental participation in education can help improve children's learning and enables greater parental school awareness. Therefore, it is recommended that parental participation in school management should be considered a significant item on the plans of schools and education policies (Sharma, 1993).

Roles and Responsibilities of Parents in Children's Education

The parents' role in their children's education was explained by Berger (2008) as, the support to enabling children to have access to school and to participate in school activities. Such responsibilities include parent's assistance in homework and involvement in school organised activities. According to Glanz (2006) and Hornby (2000), parent's roles and responsibilities at home are perceived as the continuous checking of the children's school books, supervising homework, reading with children and providing the needs of the family. For Hornby (2000), parents are also the teachers of their children along with the teachers at the schools, while Finn (1998) reported that when parents support their

children with schoolwork, it demonstrates their responsibilities towards the education of their children (cited in Downey, 2002). Therefore, parents need to know that they are expected to play a role and exercise responsibilities in their children's learning at home and in school.

The parental involvement in the children's education can be successful if school leaders and parents are fully aware of their roles and responsibilities. The Solomon Islands Education Strategic Framework 2007 – 2015 clearly stipulated the roles of parents with regard to schools. They are to provide resources to support the physical environment of the schools and to develop a sense of ownership of all educational institutions. As Barbour, Barbour and Scully (2011) highlight, 'parents' attitude and feelings towards school will influence their children's feeling the same way,' (p.4). However, in practice it seems there is little evidence of this amongst schools across the Pacific Islands Countries (PICs). Parental participation in schools for most PICs is mainly through school organised general meetings (Sharma, 2005).

The parental responsibility in their children's education in some PICs is seen as not only supporting academic learning but also upholding traditional home and church values and beliefs. This is commonly done through storytelling, but also through other verbal messages when children are helping parents or elders with tasks at home. Roughan (2002) argued that formal schooling gives children new knowledge that is different from what they learn at home. He then suggested formal learning needs to align with learning and appreciation of the life values to help shape a better citizen in the community and the country. Puamau (2004), also made a similar point that 'a holistic, balanced and inter-connected approach would mean a good balance in the academic, social, physical, cultural and spiritual development of each student,' (p. 35). Likewise, people's traditional values and other cultural activities are all playing an important role in children's development (Barbour, et al., 2011). Therefore, education stakeholders need to consider the importance of incorporating both formal learning and appreciation of life values and beliefs in schools, and also to encourage parents to know the importance of upholding family traditional and life-values at home.

Research Methodology

This research study is qualitative and has used semi-structured interviews with selected participants: six parents (four mothers and two fathers) with different socioeconomic backgrounds from six different primary schools. All parents were interviewed in pidjin (the lingua franca of Solomon Islands).

Semi-Structured Interview

Semi-structured interview is one of the methods used in this qualitative research study. Semi-structured interview allows the participants greater flexibility to express themselves further in a more relaxed atmosphere (Cohen, Manion, & Morrison, 2011). It is described as a type of interview in which the researcher has a set of questions but also have the freedom to ask participants in any order they want (Menter, Elliot, Hulme, Lewin, & Lowden, 2011). The researcher chose to use the semi-structured interview method because it involves more open and flexible approaches and best suits the context of gathering information from individuals in Solomon Islands. Solomon Islanders have a relaxed attitude and prefer to freely express themselves verbally rather than in writing.

Data Gathering

All the interviews were conducted at the venues most convenient for the participants. Four of the parent interviews were held at their work places while two were in their homes. These were face-to-face interviews with all the participants and each lasted approximately one hour.

The process of checking and confirming data with the participants contributes to the trustworthiness and credibility of the data. The use of tape-recording is considered appropriate for this research project, as the raw data remains for later reference. The recording of interviews was referred to in the initial letter of invitation shown to the prospective participants as a condition of participation, but the researcher confirmed agreement for its use with each participant before the interview began. Recording also enabled the researcher to naturally take part in the conversation with the participants during the interview.

Analysis

After conducting the interviews, careful transcription was undertaken to capture as precisely as possible in pidjin before being handed back to the participants to check and confirm. Later, data analysis commenced which involved listening to the interviews again and identifying the themes. This is a strategy commonly used for analysing and reporting qualitative data (Mutch, 2005). The following themes were identified: parents' roles and responsibilities in their children's learning both at home and school, and parents' roles to the school.

Findings

This section provides the analyses of responses from parents relating to the following research question:

1. How do parents view their role and responsibilities in their children's education?

First, the introduction of the participants of this study: A total of six parents (four mothers and two fathers) participated in this study and are identified by pseudonyms as John, Erica, Jack, Angela, Katrina and Fransina. Four of them (John, Erica, Jack and Angela) are in formal employment and residing in Honiara, whilst two other parents (Katrina and Fransina) are from the rural primary schools in the Guadalcanal province. John has formal qualifications in healthcare and Angela is a qualified business administrator. Jack works as a grounds person at the national football stadium in Honiara and Erica works part time as a gardener for an expatriate. Katrina is an active leader in her community and Fransina is a house wife. Fransina and Erica never attended formal education. Jack and Katrina only completed primary school.

Parents' Roles and Responsibilities in their Children's Education

Parents interviewed in this study considered that they were active in their child's education, both at home and school. The support they identified at home included: providing food, help in homework and giving verbal encouragement, providing extra activities and schedules, teaching traditional values, support in extra-curricular activities and providing school requirements.

At Home

When asked the question 'how do you help your child at home?' they responded as explained below:

Providing Food

All six parents in this study stated that providing food and making sure children eat well before going to school in the mornings is an important aspect of their supportive role. They understood that when children have enough food they are willing and alert to do well in school. Erica's comment was typical:

'I see my role as a parent is to make sure my children have something to eat before going to school every morning and have something to eat at school. If they are hungry they will feel lazy or weak in class and did not learn well.'

Supporting Homework and Giving Encouragement

All parents in this study acknowledged that they are involved a lot in their children's learning through checking school books and helping with school homework, as stated by John:

'I check my child's school work almost every night. My son is too shy to approach me even though he has problem with school activities but I am the one that always ask to see and go through his work with him. I always making sure I do my part and not to wait till he asks for help.'

Erica and Fransina termed themselves as illiterate with very little reading and writing skills. They reported that since they have a very limited formal education background they did not help their children with school work, however they perceived their continuous encouragement as their support towards their children's learning. They believed that continuous encouragement can help their children be eager to attend school and excel in their learning. Fransina explained:

'I can check and go through my children's school work with them but I could not do much because I too cannot read and write well, however I always do my part reminding my elder child to study hard and do his school work properly so that he could do better in his exams.'

Extra Home Activities and Schedules

Two of the six parents stated that homework was not sent home every day, however to keep the homework routine every night they provided extra activities for their children to do. As John stated:

'I always ask my son for homework but when there is no homework from school for the day I make up extra activities for him to do just to keep him busy.'

When it comes to supporting children, Katrina and Erica believed that introducing schedules and training them in the important tasks at home, besides school work, are ways of teaching children to do things for themselves when they grow up. Erica explained:

'I also teach and involve my children in the important roles in our home like cooking, cleaning up, taking care of each other and helping me in the food gardens. I want them to practice these duties so that when they grow up they can do things for themselves.'

Angela also commented that her involvement in her children's learning is not only with school work but also supporting what her children were interested in after school hours:

'I always support my children in any extra curricula activities they involved in. My two children are part of the school's scouts and Girl Guide groups. My assistance in these activities is through finance. I involve in extra activity because I see my children are interested in outdoor program.'

Teaching Traditional and Life-values

Two parents in this study believed that educating their children about traditional home and church values and beliefs was important to help shape their character when they grow up. As Fransina stated:

'I try my best to help my children at home with school work and not forgetting traditional, home and church values such as regularly attending church activities, display good behaviour, sharing, caring and respecting the elders. I think we must support our children by teaching them important values in life. I want my children to know how to read and write and at the same time know our tradition and church values to shape their lives as they grow up.'

At School

Parents interviewed considered that they were actively involved in their children's education by supporting the school in essentially two ways: through providing financial support, and involvement in school programmes and committees.

Financial Support

When these parents were asked about what support they provide to the school, they pointed out that they support the schools financially. They commented that their financial support for the school is significant for them, and that demands for financial support towards their children's learning are increasing. These demands include school fees, school contribution and stationery, other resources that they offer during fundraising activities, and the provision of classroom resources.

It is a requirement that parents must pay their children's school fees to ensure their children a place at school. Furthermore, some schools are now asking parents to pay additional school contributions. Erica stated:

'My children's education is my priority. Even though the school fee is beyond my salary, I always try my best to find money to meet it and other school contributions that are requested by the school. I want my children to have good education and a better life.'

School stationery and other school necessities are also provided by parents as Katrina said:

'I struggle to make ends meet by involving in small things that can generate money like selling cakes to help provide all the school requirements for my child like school fees, uniform, school contributions and stationery.'

Financial requirements to attend school are still viewed as a barrier for some families. All six parents in this study believed schools should seek funding from other sources. Angela and Erica commented;

'The school leaders and school committees should look for other ways to obtain funds for the planned school projects so that parents do not have to contribute money all the time as this can add extra burden to some parents.' (Angela)

'I think the school asked too much contribution from us. As a single mother, I find it really hard to find money for all these school requests and at the same time to cater for my family.' (Erica)

Involvement in School Programs

The six parents in this study expressed their active involvement in their children's learning through participation in school programmes that were organised by the schools. The school programmes identified were: school fundraising, volunteer work such as school clean up days and renovation, and offering free advice to parents and assisting their schools through their expertise.

All parents in this study stated that supporting their children's learning was through participation in the organised programmes like 'school fundraising' that can generate funds for school development. As Angela explained:

'Yes, the school always asked us to participate in the school fundraising drives. At first the school identifies a school project, for example, the school chapel, then there will be series of fundraising activities which we took part in. Sometimes they allocated an amount of money that each family to contribute. Other times we were asked to bring cooked food or other items to sell at the fundraising venue.'

However, Jack also stated that sometimes he did not attend the school organised fundraisings, as explained:

'Sometimes I just reluctant to turn up to some fundraising activities due to mismanagement of funds by the school leaders.'

To minimise this concern about mismanagement of school funds, parents suggested that they could be included in planning how to use the funds, as Angela stated:

'I think it is important for all parents to involve in any school planning and decisions. I recommend school leaders must always consult parents for ideas because after all the parents are the supporters of all the developments of the school, therefore we need our voice to be included.'

The parents in this study therefore suggested that school leaders be transparent in their leadership so that parents trust them and are willing to support the school programs.

Volunteering is doing something without being paid. The six parents indicated that their volunteering was a resource and support base for the school, and also to show their children the importance of

participating in the school programs. Parents viewed their volunteering in the school programmes as their support to the schools' development and their children's learning. As John explained:

'The school clean up days are always towards the end of each month. The school always remind us by sending us messages through written notes. The clean ups involve brushing or weeding around the classrooms, walkways and cleaning the classrooms.'

While volunteering occurs when someone is willing to offer his or her service for free, Jack revealed that school cleaning up is a task that parents must do because there is a penalty imposed if they do not turn up:

'The cleaning of the school compound is the responsibility of the parents. In our school, when it is time for it, all parents are expected to attend and participate. For those parents who did not turn up they must pay a fine as a penalty for absence.'

In the rural areas, most classrooms and staff houses are made from local materials which may only last up to ten years. Therefore, renovation work is always one of the parents' responsibilities, as Katrina expressed:

'Few of our classroom and school staff houses are made from local materials like sago palm leaves, bamboo, bush rope and sticks. When there are renovations needed, the school leader asks parents for help. Parents provide free labour and the school provide food to feed those who work. Usually the men do the renovation and the women helped by preparing lunches.'

Three of the parents were also supporting the school through offering their time and expertise in particular ways, such as classroom teacher aid, sports coaching, offering free advice to the school and the parents, and being on the Parent and Teacher Association (PTA) or school committee. The schools ask some parents to help in more specific ways due to the parents' circumstances and knowledge. Fransina perceived one way of being involved in her child's education was through helping out as a teacher aid:

'I walked to and back from school with my two children every day because one of them is too young to walk to school. We live thirty minutes far from the school. Sometimes my child's teacher asked me to help in the classroom by telling custom stories to the children. I also helped by supervising students while the teacher helped others. I enjoying doing sharing with the children and I also learnt a lot from these experiences.'

John commented:

'Once I was asked by the school leaders to give talk to parents during general PTA meeting about good nutrition breakfast for children in the mornings and for their school lunch. I appreciate this opportunity because it goes in line with my job as the

coordinator of the health education which involves promoting healthy eating for children.'

Two of the parents in this study were elected by the parents of their schools during the PTA meetings to become executive members of their School Committees. These parents said that it is an honour to be entrusted with the opportunity to share ideas and be involved in plans and decisions for their school's development. As John stated:

'I am a member of the PTA committee and a member of the fundraising committee. Our role is to plan and organise fundraising activities for all parents to participate in. Our committee identified a school project. To accomplish this, we need funds. We therefore asked parents to contribute certain amount of money or bring food to sell to the public to raise the money. The turnout from parents towards these planned activities are always good.'

The parents interviewed in this study acknowledge the importance of their roles and responsibilities in their children's learning, and they identified being involved in different ways, both at home and school. Provision of support in their children's homework and the importance of their attendance at school for their futures were highlighted. In addition, parents acknowledged that involvement in children's learning is not only waiting for what the school offers, it is also about providing extra homework activities, training children to schedule their time and teaching them traditional values and beliefs. At school, these parents were involved in organised programmes such as school fundraising to generate funds for school development, in volunteer work, and on school committees to help with organising school programmes.

Effective Communication

When asked about parent-initiated communication with the schools, parents in this study acknowledged that most of their visits to their schools were to drop off and pick up their children. They also visit the school to do what is required from them, for instance to pay school fees, school contributions, attend PTA meetings and fundraisings. John and Erica commented:

'Once or twice I visited the school to pay my son's school fees and school contributions. Parent interview sessions occurs twice a year is another session that can bring me to school. Most of my visit to school is requested by the school leader, thus there was no volunteering visits.' (John)

'I only visit the school to pay school fees, school contributions or to attend meetings or fundraising. There were no volunteering visits because I am busy with work.' (Erica)

However, Fransina's case was different. She indicated that there was no time that she ever discussed her children's work or school activities with the school staff. She had concerns, but was too scared to voice them to the school leaders. She had voiced a concern once to a school committee member. As she explained:

'No, not any time I discuss with my children's teacher or the head teacher about any issues concerning my children or the school. I did have a concern about my elder son's teacher who is frequently absent from class, and while he is away our children would do nothing. Once I shared this concern to the chairman of the school committee because he is my relative, but still there is no change. I am not happy with this attitude, but I am too scared to tell the head teacher.'

Two parents identified 'Teacher-Parent interview' sessions as key communication times when they perform their roles in their children's learning through discussing their children's learning progress with teachers. These two parents mentioned that they were always looking forward to attending these sessions. As John explained:

'The teacher-parents interview sessions are done twice a year in our school. This is the time the teacher and I go through my child's school work and discuss about his learning progress. I always attend these sessions because the teacher shows me my child's examination grades and tell me what my child needs to improve on. It is also a time that the teacher let me know about my child's behaviour in and outside of the classroom.'

Four parents in this study wished their schools would have such a programme to give them the same opportunities. As Jack stated:

'I did not remember having any face to face communication with my children's teachers. Communication concerning children's work progress is lacking in our school. The only time I see how my children are performing is during the end of the term exam written reports which at times I did not understand what it means. I wish our school conduct teacher and parent interview sessions to explain the reports.'

Summary

The six parents in this study knew of their roles and responsibilities in their children's learning both at home and school. However, they revealed that they would like to see schools and parents working together to create partnerships for the betterment of their children and the school. They considered that continuous communication from schools to the parents would result in the building of positive relationships, trust and respect between schools and parents.

Discussion and Recommendations

This study has explored the views of parents regarding their roles and responsibilities in their children's learning. Those involved in this study have been found to be actively involved in their children's learning and believe that education can help their children in the future, yet they also admitted that more could be done to enhance the relationship between parents and the school. This study helps to fill the gap in literature concerning the parents' perceptions in Solomon Islands, where existing literature focuses on parents' views on their roles and responsibilities in their children's learning in other countries (Downey, 2002; Glanz, 2006; Hornby, 2000; Mapp, 2003). In this section, the study findings are compared to

existing literature, findings further drawn out, and recommendations made for the Solomon Islands case.

Parents' Roles and Responsibilities in their Children's Education.

In reference to the question of whether parents know their roles and responsibilities in their children's learning, the findings of this study clearly showed that the six parents interviewed understood roles and responsibilities for their children's learning at home and at school. This finding is consistent with research by Glanz (2006) and Hornby (2000) in which they noted that parents of different backgrounds are all engaged one way or the other in their children's learning.

At Home

This study found that the provision of breakfast and lunch was one of the parents' roles at home. The parents believed that a hungry child will not concentrate well in class. This belief is similar to Downey's (2002) argument that 'children perform better in school when their learning is not compromised by hunger and other distractions,' (p. 123). The six parents also took an active role in the provision of school requirements such as school uniforms, stationery and school fees because these are required by their children to attend school and used for their classroom activities. Parents' acknowledgements of their support for their children's learning is similar to the Canadian study (Brock & Edmunds, 2010) that parents care, support and want the best for their children. The parents in this study provide their children's school needs and requirements because they recognised the importance of education and want the best for their children's future.

School Homework and Extra Home Activities

Most parents in this study perceived their role and responsibility in their children's learning was to check their children's school books, supervise homework and provide extra school activities. Findings revealed that homework is not sent home every night; however, some parents who are eager to keep the routine and momentum of homework, continue to give extra homework activities. Brock and Edmunds (2010) found that, 'practices such as helping children with school work, homework and establishing academic goals are important to support children's education,' (p.48). Parents are also the educators of their children, therefore, assisting their children with school work is an indication that they value their children's education (Hornby, 2000; Finn, 1998). In this study it was evident that some parents did not always rely on tasks given by the teachers, but they act as teachers themselves and set up activities for their children to do at home.

Verbal Encouragement and Extra-Curricular Activities

The study showed parents with limited formal education still provide encouragement to their children when it comes to supervising homework. Parents with no education qualifications cannot fully help their children in school work (Finn, 1998). However, the two less educated parents in this particular study realised the important of sending their children to formal education. They did not want their children to miss out on opportunities they had missed in their lives. Although these two parents cannot do much when it comes to school work or homework, their main support to their children was through continuous verbal encouragement for them to attend school and reminding them to work hard to pass exams in order to get a good job for their future. These findings are in agreement with those of Mapp's (2003) United States of America study which found, 'verbal encouragement was important as an

indicator to children that they, as parents, were serious about the importance of school and receiving a good education,’ (p.44). This is also supported by the Australian Scholarships Group (ASG, 2012) survey to gain teachers’ insights into parental involvement in children’s learning. It was found that parents can support their children by encouraging learning through verbal and moral support. Therefore, it is part of the school leader’s role to advise parents of the importance of continuous verbal encouragement at home.

Findings in the present study suggested that supporting children’s education is not only to do with school work but also about supporting children’s after-school interests. This may include sports or other programmes in which children can participate. This is in line with Mapp’s (2003) study that parents felt after school activities, ‘enhanced their children’s educational experiences and fully supported their children’s involvement in these activities,’ (p. 46). Therefore, parental involvement in children’s learning depends on the knowledge and skills parents are equipped with. This study showed that this generation of parents in Solomon Islands values the importance of education and that they would do everything possible in support of their children.

The study also revealed that some parents had imposed home schedules such as time for homework, cleaning up, reading and teaching of traditional and life-values as their roles in their children’s development and education. This is consistent with Puamau (2004) who argues that, ‘a holistic, balanced and inter-connected approach would mean a good balance in the academic (mental), social, physical, cultural and spiritual development of each student’ (p. 35). Consequently, the parent’s role in setting up home schedules and educating children on traditional beliefs and life values at home is believed to help shape children’s everyday life.

At School

This study found that parents are actively involved in their child’s education in the school environment through their support of the school in two ways: (1) providing financial support, and (2) involvement in school programmes and committees. Although these findings are similar to parents’ activities in other countries, the specific nature of these activities varies somewhat.

Financial Support at School

The area of financial support towards children’s learning in most countries includes provision of school fees, school contribution, stationery and other resources that they contribute. In the Solomon Islands, some schools ask parents to contribute cash money towards school planned projects and this is called a school contribution or school development fee. It is the school’s extra charge (fee) to parents/guardians to cater for any development project for the school or to meet whatever expenses that do not fall within the government paid school grant. Hornby (2000) also confirmed that, ‘raising money for schools has long been an important role which parents have played in their children’s schools,’ (p. 13). The Solomon Islands parents in this study thought that these fees were compulsory and enabled their children to enrol at the schools. This shows that even though parents complained about the increased financial demand of their children’s education, in fact they are committed to meeting all these school requirements. This is an indication of how parents highly value their children’s education. However, it is obvious that financial requirements to attend school are still viewed as a barrier for some parents and children. This study would suggest that the MEHRD could revisit policy in this area and that school

leaders prioritise spending, so that parents' contributions remain at a reasonable level to ensure their children's attendance and participation in education.

Further, according to this study, financial support towards the children's learning at the primary school level is becoming a burden and is demanding on parents even though the Solomon Islands Government (SIG) provides school grants. The increasing demand from schools is not fair on parents given the SIG has increased its grant to schools, and parents could expect financial demand from schools to decrease. This finding is contradictory to what is stipulated in the MEHRD (2009) Policy Statement, that the Fee Free Basic Education (FFBE) was initiated to stop the increase in school fees. Therefore, parents need more awareness from MEHRD, EAs and school leaders about the changes in the education policies.

All interviewed parents suggested the stakeholders of education should look for other possible ways to obtain funds towards schools' development so that parents do not have to contribute money all the time as this can add an extra burden on their budgets. This suggestion is similar to that of the Asian South Pacific Bureau of Adult Education (ASPBAE 2007; 2011) survey, that the, 'government should immediately review its school financing policy and abolish the requirement on parents to make a co-contribution to the costs of schooling,' (pgs. 12 & 14). In this regard, this study concluded that paying school fees, school contributions and making other contributions towards fundraising activities is still a barrier to education for some children in the Solomon Islands primary schools. One recommendation is for all education stakeholders to work together, ensuring that 'Education For All' is actual and not just a political slogan from the government.

Involvement in School and Committees

This study also found that parents' role and responsibilities to the schools were through participating in school programmes that were organised by school leaders. As identified by all parents in this study, this included school fundraising. Parents from both urban and rural schools indicated that most of the fundraising activities were associated with parents providing food. Literature found that fundraising is the main activity relied upon to further the school development plans (Hornby, 2000). This mode of generating funds was also stipulated in the Policy Statement and Guidelines for Basic Education in Solomon Islands (MEHRD, 2009), stating that parents are expected to contribute through fundraising activities planned by the school management.

In addition, the parents in this study viewed volunteering at school as another way they supported their children's learning. As in the rural areas, this includes renovation work on school buildings which is often done by parents. The study showed exactly what MEHRD (2009) highlighted in its policy for schools that the 'provision of labour' to schools is one of the roles expected from the parents (p. 41). However, it was found that parents' attendance in these programmes depended on available resources to contribute or time available. The reasons given for not attending are similar to findings of Hornby (2011) and Brock and Edmunds (2010) in that parents were either busy with other work or not happy with the school leadership. It is recommended, therefore, that school leaders organise programmes for parents at times that are convenient to parents and think of other ways that parents can help, but at levels they can afford. In addition, MEHRD and EAs might be advised to conduct sessions on documents, such as the Education Act and Teachers' Service Handbook, with school leaders to clarify their roles and responsibilities. This would allow school leaders to better inform their pupils' parents about these policies for clarification and advice on what schools can and cannot ask of parents.

Other volunteering included teacher aid and providing free advice in which three out of the six parents in this study were involved. These parents were requested by their schools because of their expertise and their availability on location where help was needed. Fransina was asked to help because she used to sit outside the classroom. John was asked to talk on healthy nutrition and food for children because he was a qualified health officer, and Jack was asked to check on the school's playground because he was a stadium grounds man. The study found that the involvement of parents in school programmes was not from their own initiative but on request by the school leaders. Requests from the schools to help as teacher aids are very rare, which indicated that most teachers are not proactive or lack the knowledge and skills to involve parents in classroom learning. As Hornby (2000) demonstrates, parent helpers remain a largely untapped resource, therefore, most parents simply wait for the school to ask them, rather than initiate the help themselves. The most available resource in communities are the parents, which teachers can arguably use (Glanz, 2006). However, 'teachers need the skills required for involving parents in their children's educational programs both at school and home,' (Hornby 2000, p. 9). Hence, the findings of this study suggest that the School of Education (SOE) at the Solomon Islands National University (SINU) could train teacher trainees about the significance of involving parents in class and outside activities and equip them with the knowledge and skills to do successfully. This information could also be part of the MEHRD's policy for the schools.

According to this study, two out of the six parents were selected by the parents of their schools to be part of school committees. MEHRD (2009) highlighted that, 'the purpose of the school committees is to develop school development plans and visions, endorse policies and provide a governing body to manage the school.' (p. 37). Interestingly, one of the two parents involved in the school committee was not aware of their school vision. In this regard, findings suggest that there would be benefit in MEHRD and the EAs organising workshops to update school leaders and school committees about education policies and on their roles and responsibilities in governing the school. Recently, MEHRD trained school leaders, school committees and PTAs on the handling of the school grant and their roles in administering school affairs (MEHRD, 2011). However, there has been no evaluation following the training to see how successful it was. School committee membership changes often, therefore, such training needs to be delivered regularly to update new committee members.

Effective Communication

It was also revealed that none of the respondent parents had volunteered to visit their child's classroom to see what was going on. Some parents just wait for the teacher-parent interview sessions to discuss their child's learning. Others fear that the school leaders might be angry at them if they voice their concerns. For some, it was their education background that holds them back because they lack confidence to interact with teachers. Parents hold back because they lack the knowledge and confidence to participate (Hornby, 2011; Reay, 2005). This study has indicated that visits to school tend to be only on request by schools. Voluntary visits to see and learn what is going on in the classrooms is uncommon for parents in the Solomon Islands. Therefore, this study suggests that school leaders set up regular opportunities for parents to come to school to talk to school staff about their children's learning progress and other school programmes.

Teacher-parent interview sessions at school is another programme some schools initiate. These involve both teachers and parents discussing the children's learning progress in class. This study found that only two out of the six schools organised teacher-parent interview sessions and those two parents spoke

highly of this programme. The interview sessions tended to be the only time when parents met face to face with their children's teachers to receive feedback about learning progress. It also gave opportunities for parents to ask questions and express their concerns. As Timperley and Robinson (2002) and Hornby (2000) have found, children whose parents are regularly involved in face to face meetings with the teacher improve academically. Furthermore, research studies have shown that these sessions also had a positive impact on the relationship between the teacher and the parents (Dorovolomo, 2007; Glanz, 2006; Hornby, 2000). Four parents in this study wished their schools would have such a programme to give them the same opportunities. However, this is not a programme that is recommended in policy for all school to implement. It is recommended, therefore, that MEHRD consider making a teacher-parent programme a requirement in all Solomon Islands primary schools.

In addition, the findings indicated that some parents want to support the school, but they are discouraged from doing this because of school leaders' decision making and management. Some parents are reluctant to attend fundraising activities due to disagreements over the mismanagement of school fees, contributions and fundraising funds by the school leaders. The parents therefore suggested that school leaders to be transparent in their leadership so that parents trust them and are willing to support the school programs. For schools to improve in this area, this study suggests that parents have to be part of the decision making on the school development. This is aligned with Ganzero's (1999) argument which asserts that, 'parents and community involvement in decision making helps make the school more accountable and fortifying links between the school and the parents,' (p.13). Therefore, school based workshops for school staff could be ideal to improve their skills, as some school leaders had difficulties in involving community participation in the school and have faced difficulties in decision-making (Lingam, 2011).

Conclusion

This research aimed to capture parents' perceptions on their roles and responsibilities in their children's education. This study found that despite a variety in the parents' socioeconomic backgrounds, they all recognised the importance of their children's education at home and in the school. At home, they support their children through providing food, helping in homework, giving verbal encouragement, providing extra activities and schedules, teaching traditional values, supporting extra curricula activities and providing school requirements. At school, they provide support in two ways: through financial support and active involvement in school programmes and activities. However, findings do indicate that school leaders could do more to encourage parents' involvement in their children's education. All parents in this study suggested that they were seeking further guidance and advice on how they could help at home and school.

Based on the study findings, recommendations focus on how to improve effective parental involvement in their children's education in the Solomon Islands. It is recommended that schools communicate with parents about their children's learning progress through regular teacher-parent interviews. Other ways to minimise the identified factors that inhibit parental involvement include that school leaders learn more about their own role in building partnerships with the parents through effective communication and involving parents in school decision making. A national policy on parental involvement in education would clearly set out expectations for schools, teachers and parents so that each group understands their roles and responsibilities.

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Te aomata: Cultural Influences for Leaders in Kiribati – A Case Study of School Principals

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Abstract

The aim of this study was to explore cultural influences on leadership practices of school principals in Kiribati. The study adopted a qualitative approach using interviews, observations and questionnaires to investigate the situation for teachers, principals and support staff at two government senior secondary schools in Kiribati. The study confirmed the global literature that recognises the importance of culture for effective leadership. In particular, the findings identified specific important cultural influences on leadership in Kiribati as: *kabongana te aomata* (treating people as important); *oi n aomata* (being a genuine or real leader); and *ataatai aomata* (being good-hearted). The study also found that, at times, there was conflict between a principal's obligation to comply with regulation and policy whilst also employing appropriate cultural behavior. This study builds a platform for further similar research in other Pacific Island Countries to identify similarities and differences, and in particular, to identify country-specific important cultural influences for effective leadership. It is recommended that the findings of this study are incorporated in training for all school personnel in Kiribati. This study has provided a different dimension to the existing body of literature on culture and leadership in the Pacific region.

Keywords: cultural leadership, Pacific leadership, school leadership, respect

Introduction

...educational leaders needed to be culturally sensitive, since tradition, culture, values, and beliefs are key components in leadership effectiveness (Pacific Leaders Development Network 2007, p6).

The notion that good leadership is contextual and cultural underpins the scope of this study, which investigated leadership practices of principals at two government senior secondary schools in Kiribati. The governance of schools in Kiribati is the responsibility of the Ministry of Education with principals as an integral link between school operations and government policy. At the Pacific Leadership Development Network (PLDN) workshop in 2007, it was claimed that shortcomings in the education system in the Pacific region are the result of poor leadership in schools (PLDN, 2007). Furthermore, in the Pacific region, good or effective leadership that is grounded on Pacific culture has been noted as a major issue in national development initiatives. On this, the Framework for Pacific Regionalism clearly identifies Pacific cultures and traditions to be among major influences that will guide improvement in Pacific administration, leadership, policy making and implementation (PIFS, 2013). This premise is supported by empirical studies conducted mainly in Europe, USA and Asia, which have found that

leadership practices and styles are strongly influenced by culture (Chhokar, Brodbeck, & House, 2013; Hofstede, 2011; Sanga, 2005).

Leadership in Kiribati is strongly influenced by culture, founded in the traditional system, known as the *maneaba*, where leaders in Kiribati were men known as *unimane*. The *unimane* are considered wise and honorable and must always be respected. However, in the twenty-first century, women in Kiribati are increasingly seen in leadership positions, which indicates a change in gender roles with similar levels of respect given to both males and female leaders, such as school principals. Nevertheless, in the villages, and particularly in the outer islands, the traditional *maneaba* system and the role of the *unimane* still exists strongly with male dominance. There remains a strong belief that disrespecting the *unimane* will result in being cursed or having bad luck. It is argued that this belief is the foundation of the high level of respect given to all leadership positions in Kiribati. The design and methodology adopted by this study started with the premise that due to this high level of respect, school principals have a paramount role in driving change in schools and education.

At the same time, it is argued that change in Kiribati schools in the areas of curriculum, pedagogy and assessment methods has been slow to progress within the region. Accordingly, it is argued that this is due to deficiencies in leadership practices. This study therefore sought to explore the situation of leadership as one means to contribute to developing effective change and improvement for schools in Kiribati and the Pacific region.

The aim of this study was to investigate the leadership situation through a culture sensitive lens to identify appropriate and effective behavior for school principals in Kiribati. The trustworthiness of the collection and analysis of the data was enhanced by the fact that one of the researchers is I-Kiribati and has previously worked as a principal at a government secondary school in Kiribati, whilst the other Australian researcher has more than five years of experience working in education in Kiribati, including a position of principal at Technical and Vocational Education and Training (TVET) institute.

Literature and Conceptual Framework

The theoretical framework of this study on cultural influences for school leaders in Kiribati was based on Hofstede's cultural dimension theory which identifies the similarities and differences in norms, values, views and practices among societies (Chhokar et al., 2013; Hofstede, 2011). Subsequent studies have used this theory to match cultural dimensions with particular leadership practices and styles (Hofstede, 2011; House, Hanges, Javidan, Dorfman, & Gupta, 2004; Northhouse, 2013). There is agreement within the research on cultural dimension theory that leader effectiveness is contextual, meaning that it is embedded in societal and organizational norms, and the values and beliefs of the people being led (House et al., 2004).

Leadership

Contemporary research suggests that the most effective leaders, 'use a collection of distinct leadership styles – each in the right measure, at just the right time,' (Goleman, 2000, p. 2). More importantly the use of various leadership styles can be studied, learned and practiced (Lester, 1975).

Early leadership theories, such as Trait Theory, suggest that leaders are born as such, or leadership characteristics are inherited (Horner, 1997; Miskel & Hoy, 1996). Through the process of development, leadership theories then moved away from a focus on traits to that of behavior (Dugan & Komives,

2010; Northouse, 2013). With the emergence of contingency or situational theories that subsequently emerged, an emphasis was placed on flexibly applying knowledge and skills that are appropriate for particular situations (Dugan & Komives, 2010). Transformational or transactional theories then further shifted the focus for leadership behavior towards creating an environment in which people are motivated and influenced to achieve common goals (Dugan & Komives, 2010; Northouse, 2013; Yukl, 2002).

The most contemporary leadership theories, such as ethical or authentic leadership, view leadership in the workplace as a process where leaders and employees are interacting and working together (Goertzen, 2012; Malasanka, 2004). The leader is not considered in charge of others but rather part of a team who share common values, beliefs, culture and ways of doing things. This type of leadership promotes collaboration, teamwork and unity (Avolio, Walumbwa, & Weber, 2009; Miles, 2007).

Accordingly, leadership can be viewed as a process of influence whereby leaders apply their own beliefs, values, ethics, character, knowledge, and skills to influence others in accomplishing tasks and guiding the organization to achieve its goals and vision (Yukl, 2002). In this process, the main task of the leader is to significantly influence the behavior of those working in the organization to be motivated, committed and inspired to be effective and efficient (Winston & Patterson, 2006).

However, culture is a factor that limits the generalization of leadership theories (Cheng, 2005; Manning & Robertson, 2002; Slater et al., 2006). Globally, societal culture is now recognized as a key factor that impacts on the effectiveness of leadership theories when transferred to practice (Bush, 2003; Shahin & Wright, 2004). This view that culture is an important factor for improving leadership is confirmed in Pacific studies from Solomon Islands (Sanga, 2005), Samoa (Fa'aulufalega, 2008), Tonga (Johansson-Fua, 2001), and Tokelau (Aleta, 2011).

Culture is a unique feature of a society that differentiates one from another (Shahin & Wright, 2004). Thaman (2001) defined culture from a Pacific perspective as, 'a shared way of life of a group of people, which includes their accumulated knowledge and understandings, skills and values, as expressed and constructed in their language, which is perceived by them to be unique and meaningful,' (p.11). It is believed that culture is a blueprint that constitutes the people's beliefs, values and attitudes, and their roles and role expectations as well as the way they interpret and make meaning of their own behavior and other's behavior (Shahin & Wright, 2004; Slater et al., 2006; Thaman, 2001).

Accordingly, for a leader to influence motivation, commitment and inspiration in a workforce, they should try to align their behavior with the important cultural beliefs that are practiced by everyone in the society. It is argued that culture in Kiribati is undervalued as an important influence on leadership. The aim of this study was to identify specific cultural influences on leadership in Kiribati in order to address this situation. This will provide a different dimension to the body of literature on culture and leadership in the Pacific region.

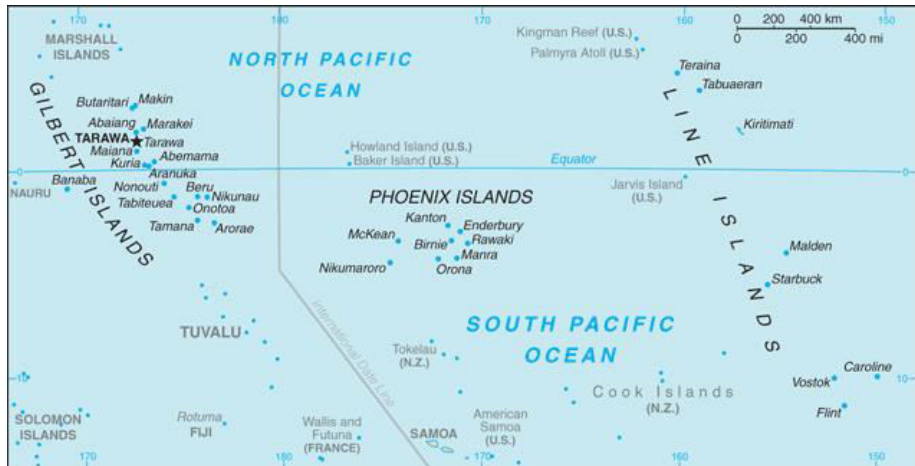
The Study Context

The Place

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 as seen in Figure 1. In the west are the Gilbert Islands lying north of Tuvalu and Fiji, the central Phoenix Islands are north of Tokelau and Samoa, and in the east the

Line Islands are north of Polynesia. Tarawa is the capital, and Kirimati (Christmas Island) in the Line Islands is the world's largest atoll. The huge spread of tiny land mass presents a unique challenge to education in the country. Due to expert traditional navigational skills of the Kiribati people, domestic travel between the islands was common in the early pre-colonial years. This is attributed to the homogenous situation for cultural practices, norms, language and dialect throughout Kiribati (Tabokai, 1985; Tekonnang & Talu, 1980).

Figure 1: Map of Kiribati



Source: <http://www.seamercy.org/sites/default/files/Kiribati-map-small.jpg>

The People

In the 2015 national census the population of Kiribati was recorded at 110,110. It was noted that South Tarawa is home to approximately half of Kiribati's total population (Kiribati National Statistic Office, 2016). The citizens of Kiribati are called I-Kiribati. Kiribati is recognized by the United Nations as a '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 60 per cent (UNCTAD, 2014). The increase in the number of school dropouts and decrease in the success rate of students at the senior secondary schools has a critical impact on the national economic and social position. In this regard, Kiribati continues to prioritize the development of a quality education system in its national development plans (MFED, 2011; MoE, 2012). However, it is argued that the development of school leadership in Kiribati has still not been identified as a priority area in key education documents such as the Education Sector Strategic Plan (MoE, 2012). Rather, priority is given to the development of a wide range of other variables such as a competent and effective teaching workforce (quality of teachers), school facilities and resources, curriculum, regulations, and policies.

The Society

The social and political structure of Kiribati is considered to have a strong influence on the perceptions, attitudes and behavior of those in positions of leadership. Traditionally, the main social group in Kiribati

was called *te kainga*¹. *Te kainga* consisted of small nuclear families called *te utu*². The number of people in the *kainga* ranged from twenty to a hundred and they all shared the same piece of land on which each member family built their home (Tekonnang & Talu, 1980). The leader of the *kainga* was the *unimane*³ who was the oldest and most senior man of all the family units of *te kainga*. This leader was believed to be wise, brave and richly cultured. He had a duty to regulate all family activities regarding land cultivation and food production, and matters such as marriage, canoe building and warfare (Talu, 1985; Tito & Tiata, 1980). The *te kainga* system continues to influence families to live together as extended families.

In the present day, this social grouping supports communal living and a participatory process where people share and cooperate with each other to survive and maintain good order within their villages and islands. Today, this social grouping supports communal living and a participatory process where people share and cooperate with each other to survive and maintain good order within their villages and islands, enabled by effective leadership. It is contended that this collaborative model is one which could be replicated in the workplace.

Maneaba System

Traditional governance in Kiribati was known as the *maneaba* system⁴. *Maneaba* literally means meeting house and remains the focal point where issues of social, political and economic significance are discussed (Tabokai, 1993). Although the *unimane* may not be well educated, in the *maneaba* system the *unimane* still have ownership of decisions, and senior government officials such as Ministers and Secretaries are obliged to respect and obey their decisions. Senior officials often negotiate with the *unimane* to convince them of new ideas and obtain their approval.

The cultural significance of the *maneaba* system is important. For all I-Kiribati it was a traditional belief that the existence of the ancestors' spirits in *te maneaba* made the decisions of *unimane* sacred. Decisions were considered to carry the strength of a supernatural authority and reflect requirements and the will of the ancestors and the gods (Kirata, 1985). I-Kiribati strongly believe that disobedience to *unimane* directives and *maneaba* decisions will likely result in being cursed (Kirata, 1985). Consequently, all in Kiribati society are accustomed to unconditional obedience to directives that come from the *maneaba* through *unimane* (Teaero, 1997).

The leadership qualities of the *unimane* such as being wise, richly cultured and experienced, or most senior, are the expected qualities of leaders in the workplace in Kiribati. Accordingly, the value of respect for leadership decisions is given paramount importance in Kiribati culture. Such respect is connected with the position, and thus it is not restricted to only male leaders, but extends to the many women leaders in Kiribati in the present day.

¹ Kainga – a small group of extended families related together through a common ancestor

² Te utu - small family

³ Unimane – an old man

⁴ Maneaba system – traditional political system

Description of the Study

Research Methodology and Scope

The study reported in this paper adopted a qualitative approach for the data collection and analysis. This approach employed interpretivism as the underpinning theoretical paradigm. Interpretivism in this context, considers the research participants, as active agents who construct their own meanings of reality (Mack, 2010). This approach also aligns with the social constructivist paradigm underpinning the conceptual framework for the study. A social constructivist approach sees knowledge as socially constructed and thus behavior as essentially a social process. Within this concept, understanding is facilitated through cultural tools, in particular, language (Westbrook et al. 2013). In alignment with these paradigms of interpretivism and constructivism, the researchers viewed the full complexity of the ways the different participants interacted with all persons both within and outside the school environment. This was facilitated by the observations and interactions which occurred when the I-Kiribati researcher visited each school for a two-week period and also attended social events with school personnel.

Research Sites and Participants

The two participating schools were well known to the researchers, one was located on the home island of the I-Kiribati researcher and the other where she had previously worked as the principal in South Tarawa. Information on the research study was verbally presented by the researcher to teachers, support staff and school principals. Participation was sought with respect using the appropriate manner of *bubuti*, a polite Kiribati way of asking or requesting. The data was collected using, interviews, questionnaires and observation. These multiple methods allowed the researchers to use triangulation to increase the validity, reliability and credibility of the data (Maykut & Morehouse, 1994).

Four participants from each school were selected for the interviews: the school principal, the deputy principal, one teacher and one member of the support staff. The teacher and support staff were purposively selected based on availability and employment at the same school for at least the past ten years (see table 1).

Table 1: Interview Participants

School	Participant	Gender	Age	Qualification	Years of service at school
Urban based school	Principal	F	41	BEducation/Masters Education	1
	Deputy Principal	M	41	BEducation	16
	Teacher	F	49	Diploma Teaching	15
	Support staff	M	49	Certificate Teaching	17
Outer island school	Principal	M	36	BScience	8
	Deputy Principal	F	39	BArts	10
	Teacher	F	48	Diploma Teaching	12
	Support staff	M	50	Certificate Teaching	10

Ethics approval was granted from the schools and the Ministry of Education in Kiribati. Additionally, ethics approval was obtained from the researchers' employer university. All participants who volunteered for the study provided written and verbal consent.

Data Collection

The I-Kiribati researcher visited each school for a period of two weeks to collect data. During this time, she observed the behavior and interactions of all school members during staff meetings, daily staff briefings, and work and social interactions during and outside school hours.

Questionnaires comprising open and closed questions were issued to all teachers with more than ten years teaching experience. Approximately 50 per cent of teachers at both schools received these questionnaires with a return rate of 50 and 80 per cent, respectively. A total of 27 questionnaires were received for analysis. The questions explored views on the principal's behavior regarding decision making in the school, seeking input and advice from teachers, trust and confidence in teachers' capability, and sharing of leadership authority. Cultural behavior of the school principal was explored through questions focused on relationships and influence related to areas such as: communication, language and words, teamwork, decision making, delegation of authority and responsibility.

The individual interview process was conducted using the language of I-Kiribati and the cultural process of *maroro*. *Maroro* is the Kiribati way of conversation which is mainly informal. When seeking participants availability for the study, they were informed that the *maroro* process, rather than an interview, would be used. This is important since the term 'interview' in the Kiribati context is considered a formal process where interviewees are obliged to answer questions to suit the expectations of the interviewer. *Te maroro* is considered more like a free conversation where truth and facts are the focus. *Te maroro* approach is therefore considered more effective in obtaining views, ideas, beliefs and feelings that extend beyond the researcher's scope of questions. *Te maroro* style is parallel to the *talanoa* research approach commonly used in Fiji and Tonga. *Talanoa* is considered a culturally appropriate ethnographic Indigenous research method in the Pacific due to its compatibility and appropriateness to suit the Pacific islands cultural ways of communications and dialogue (Farrelly & Nabobo-Baba, 2014; Sharma, 1996).

Data Analysis

The data were organized in key areas related to the research questions: leadership practices used by the principal; key cultural qualities considered important by the participants, and; key cultural practices considered most important for principals as leaders in the school. Common views and ideas, and recurring phrases and words were coded and categorized, and themes were developed to suit the group of main ideas. Concepts emerged from the noted observations and responses in the questionnaires and interviews. The main themes to emerge that reflect key cultural influences on leadership behavior in Kiribati were categorized as: *Kabongana Te Aomata*, regard for every individual as important human beings; *Ataatai Aomata* meaning to be good hearted, and; *Oi n Aomata*, a real or authentic person. The next section presents findings and offers discussion according to these three thematic areas.

Findings and Discussion

Kabongana te Aomata

Kabongana te aomata refers to the practice of regarding everyone as important as they are human beings and thus deserve good and proper treatment. Participants' comments indicated that principals predominantly demonstrated the cultural practice of *kabongana te aomata*, which includes fairness, respect and interpersonal relationship.

Fairness

Behavior considered to reflect fairness was noted by the participants and observed in practices of the school principals. An example in both schools was the housing arrangements that provided all school personnel equal opportunity to live in the different standards of housing available. Participating teachers reported that they expected the principal to be fair and the principals reported they were mindful of the need to practice fairness in their school leadership. Fairness and equality are the basis of leadership in the *maneaba* system and within families in Kiribati society. Kiribati society is basically egalitarian and is maintained through the ideas perpetuated in the *maneaba* (Lundsgaarde, 1964; Tabokai, 1993). The cultural value of fairness in Kiribati is derived from the traditional belief that social equality is a contribution of the gods. Since Kiribati was created by the gods, it is a belief that it would be an offence to treat one individual better or different than another (Tabokai, 1993).

The importance of fairness in leadership is not unique to the country of Kiribati. Global research has shown that fairness by leaders is associated with higher job satisfaction, greater commitment to organizations, higher task performance, more organizational citizenship behavior, and less employee theft (van Knippenberg, De Cremer, & van Knippenberg, 2007).

Respect

The principals reported they were very mindful of the cultural responsibility to always employ respect in their behavior and practices. In Kiribati, the concept of the *aomata*, is very important. This is a uniquely strong cultural aspect of the I-Kiribati people, whereby respect relates to a sense of identity – as '*te aomata*' or human being. It is claimed that this notion of respect explains why the I-Kiribati are sensitive to, and find it difficult to accept criticism, particularly in public settings (Mauna, 1979, Teaero, 1997).

It is believed that the traditional value of respect is derived from the ancestral Kiribati custom of the *maneaba* system. The traditional belief in the existence of the sun, moon and the gods in the *maneaba* led it to be regarded as a very sacred place (Maude, 1980). This sacredness of the *maneaba* imposed strict rules on behavior to be appropriate, respectful and in strict conformity to customs so the *maneaba* is not offended (Grimble & Maude, 1989). These cultural beliefs impose respect and obedience as integral aspects of the *maneaba* system, which is broadly applied in the community and influences on all behavior, communication, and interactions.

The school principals in this study reported were observed to be respectful to staff and, in particular to older staff. Respecting older people is important for culturally appropriate leadership, however it can be a challenge. For example, such challenges were articulated by a school principal in the following comment:

Respecting older staff is very important to me as I am brought up with that culture so I cannot ignore that in my leadership. Even though I am the principal, but I highly respect the older staff members and always talk to them politely and never instruct them to do their job but ask them in a well-mannered way. In addition, I always allocate them with leadership tasks at the school such as school committee leaders. I never allocated that task to the younger staff in the presence of older staff. (P01)

Similar to the situation of fairness, when the principals neglected respect, it was claimed to be due to imperatives from the Ministry of Education. However, on this, the principals reported they regretted any disrespectful actions and felt obliged to explain and justify the reasons for their behavior. They further considered it essential to ensure that staff understood their actions were due to the conflicting demands in their leadership position. The principals reported that they hoped to gain support and forgiveness for their behavior and, more importantly, to keep the staff motivated and committed to their leadership.

Interpersonal Relationship

Kabongana te aomata relates to interpersonal relationships whereby the principal values the members of the school as colleagues and friends, and is willing to connect and socialize in order to work together as one team for the school. Participants reported that principals at both schools had developed interpersonal relationships with school staff and many considered the principal to be a 'friend'.

It was claimed that a principal who treated school personnel as friends is considered good because if they act as a boss, conflict can arise. In the Kiribati culture the practice of showing your authority as a principal or a leader/boss is very shameful and principals who do this are criticized and not respected.

The findings of this study clearly reflected interpersonal relationships within the school to be highly valued by principals and school members. It was claimed that a principal who had good interpersonal relationships with school members established feelings of comfort, security, and unity within the school. Consequently, staff were willing to support the leadership, and due to their sense of 'friendship' with the principal, they were also willing to forgive when the principal's behavior may not be culturally appropriate.

Strong interpersonal relationships between a principal and staff is considered a sign of good leadership practice in Kiribati. However, it was reported and observed that in some situations when principals were under stress they would act unfriendly to support staff and teachers. The principals acknowledged that their behavior may sometimes be considered unacceptable and as reported with other behavior they subsequently felt obliged to apologize and explain their actions to the staff and teachers.

Ataatai Aomata

The findings of the study also suggest another component of Kiribati culture that is important for leadership practices. *Ataatai aomata* or being good hearted is the value of being caring, patient and loving, which can be aligned with the communal way of living in Kiribati where everyone should care and help each other. It may also be considered a derivative of the strong Christian faith in Kiribati.

Values that are highly regarded in Kiribati society include love, kindness, and care. Having these values enables a person to be genuine in their practices of *kabongana te aomata* or regarding people as important by demonstrating fairness, respect, and building effective interpersonal relationships. Several studies have emphasized the importance for leaders to shift their focus from self and put others first. According to Kouzes and Posner, (1999, p. 1) 'Leading with heart helps tap into the power of humans fully engaged in their lives and work.' A principal who is considered to be good-hearted will use this value to encourage motivation and commitment in work toward achieving school goals.

One teacher explained the behavior of a former principal who was highly regarded for being good hearted:

His actions and behavior were fatherly and we felt so comfortable with him. I never saw him explode before us when he was angry or disappointed. He was so patient and always reassuring and encouraged us to do better. When he reprimanded staff verbally, he talked calmly and politely using kind words. His lovingness and kindness made him well respected and highly obeyed even though he did look tough and fierce. (T04)

Accordingly, a principal with a good heart is one who can genuinely undertake practices of *kabongana te aomata*. Such a principal does not regret their actions or behavior as they have an overriding quality of good-heartedness which earns them respect. The principals and teacher participants in this study reported that at times, due to the need to adhere to strict timelines such as recording and reporting student attendance and results, and compiling student assessments for moderation, that they used demanding language. This behavior was also observed by the researcher when she attended staff meetings at the schools. Some teacher participants reported that they did not like being spoken to in such a 'disrespectful way' whilst others reported they understood the need for the principal to adopt an authoritarian approach.

Oi n Aomata

Oi n aomata is a Kiribati term to describe a real or authentic person who possesses good qualities appropriate for a leadership position. These qualities include a good reputation, being ethical and knowledgeable, which were referred to by the respondents as desirable traits for good leaders.

The concept of *oi n aomata* means that the leader should have integrity, be seen as a real and genuine person who has knowledge and a good reputation through demonstrating high moral and ethical principles. Adhering to moral and ethical principles in Kiribati is the practice of '*ata te riai*' (knowing and doing what is proper) and '*ata te katei*' (knowing and acting according to culture). The research literature confirms that integrity is an important quality for effective leaders. Leaders such as school principals with integrity behave in ways that are consistent with core values of the school and according to the moral and ethical frameworks shared by them and the school members (Moorman & Grover, 2009). Furthermore, authentic, moral and ethical leadership are defined leadership theories in which integrity is a core quality for a strong and effective leader (Avolio & Gardner, 2005).

As presented above, the situation in Kiribati regarding the professional and personal qualities of leaders is evident in the *maneaba* system where the leaders who are known as *unimane* are considered to be

knowledgeable, wise and highly experienced in life. Due to this belief, there is unchallenged acceptance of a leader's decisions.

School members described 'good' principals as, '*e bwati n kairiri n aron ataakin te katei*,' which translates to, 'the principal knows how to lead according to proper culture.' The school principals who were the subjects of this study were accepted as leaders due to the professional and personal qualities they exhibited rather than age or years of experience. One teacher's comment succinctly reflected a common view on younger principals:

We follow the flow in the change for modernisation and we are satisfied with the system of job allocation according to qualification. However, we highly desire a leader who is both highly qualified professionally but also knows how to practice according to the Kiribati culture. (T04)

Ministry of Education staff records (from the 1980s) revealed that with the exception of one of the two school principals in this study there have been no principals with qualifications in educational leadership and administration. However, this situation is one which is reflected in many countries, and this has attracted the attention of many stakeholders in the field of leadership (Avolio et al., 2009; Northouse, 2013).

Implications of the Study

The objective of the research study reported in this paper was to explore the cultural influences on school leadership in Kiribati to inform the development of strategies and initiatives which will give effect to change and continually improve quality outcomes for the education system.

This study of principals at the two government senior secondary schools in Kiribati identified that although there was evidence of flexible leadership style at times, leadership practices were considered often to not be aligned with appropriate cultural behavior. All participants in this study concurred that when principals employ behavior that is not considered culturally appropriate, issues arise which impact on the effectiveness of the leadership. However, the two principals in this small study claimed that any perceived or actual inappropriate cultural behavior was due to the overriding demands of the government education system with meetings, written reports and records often requiring attention within short timeframes. However, they reported a strong awareness of the importance of appropriate cultural behavior as the key to effective leadership in their schools.

This study makes a contribution to the literature on leadership in the Pacific region by identifying specific key cultural beliefs which influence views on leadership practices in Kiribati. These beliefs embrace the notion and importance of *te aomata* or the human being and were categorized as *kabongana te aomata*, *ataatai aomata* and *oi n aomata*. These key values are derived from the traditional *maneaba* system and communal way of living, which remain strongly valued components of everyday life in modern day Kiribati society.

Limitations of the Study

Although this study was limited to the leadership situation at two government schools in one remote Pacific Island Country, similar cultural influences throughout the Pacific region make possible the

potential transferability of findings within the region. These cultural similarities are demonstrated through story telling where the same stories are often told in different Pacific Island Countries with only slight variations (Tekonnang & Talu, 1980). Furthermore, the diverse and broad leadership role of a school principal reflects many leadership practices employed in the broader workforce. Accordingly, some of the findings of this research study are considered transferrable within schools, with the potential to be extended to the wider workforces of various organizations in the Pacific region.

Suggestions

Based on the findings of this study, a number of suggestions are presented for note by a wide range of interdisciplinary stakeholders. These include policy makers, leaders, teachers, workers and researchers in private industry, government agencies, public organizations and international development who are involved in planning and implementing change strategies, particularly those within the Pacific region. Some of the suggestions make specific reference to schools and education, however, it is considered that these are transferrable to the broader workforce. These are presented in no order of priority.

This study suggests that:

- Future initiatives and strategies for professional development be designed, endorsed and reviewed with input from persons with knowledge of local culture and tradition;
- Ministry of Education workforce development policy and planning should include succession planning and incorporate leadership training for principals;
- Developing school leadership should be identified as a priority in key education strategic planning documents such as the *Kiribati Education Sector Strategic Plan*;
- Pre-requisite criteria for appointment of a school principal should stipulate a post graduate qualification that must relate to leadership and/or management;
- Further research is desirable on school principals (workforce leaders) as the critical drivers of change in the Pacific region;
- Development of national standards and benchmarks for school principals, should be established, monitored and maintained in alignment with broader national and regional education objectives, and;
- Future school-based initiatives and activities aimed at change and continuous improvement in schools in Kiribati and the Pacific region should be strongly supported by the school principal.

Conclusion

This study explored the importance of aligning leadership to culture as one way to improve quality education outcomes in Kiribati. Nevertheless, it is recognized that school leadership is only one variable of quality in education.

An effective leader in the Pacific region is one who is qualified, skilled and knowledgeable in leadership practices; capable of managing their responsibilities and behavior, and; applying a culture sensitive lens in their work. Furthermore, they are aware of the critical country-specific cultural influences on their actions. The key cultural influences for the remote Pacific Island Country of Kiribati have been identified in this study. This study builds a platform for further similar research in other Pacific Island Countries to

identify similarities and differences, and in particular, to identify important country-specific cultural influences for effective leadership.

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Using the Revised Bloom's Taxonomy to Classify Learning Objectives in Mathematics: An Exploratory Study among Fijian Secondary Pre-service Teachers

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Abstract

This article describes how a small group of secondary pre-service mathematics teachers make sense of the Revised Bloom's Taxonomy Table during a teaching methods course. Two questions are explored: (1) how well do secondary pre-service mathematics teachers understand and use the Taxonomy Table to classify learning objectives? and (2) what are secondary pre-service mathematics teachers' opinions about the usefulness of the Taxonomy Table? Findings suggest that with some support, the pre-service teachers are able to understand and use the Taxonomy Table to classify and scrutinize the learning objectives. Findings also support the use of the Taxonomy Table to open up educational discussions beyond the traditional use of the Taxonomy Table.

Introduction

Meaningful learning involves students building, 'knowledge and cognitive processes for successful problem solving,' (Mayer, 2002, p. 227). Recognizing meaningful learning as an important goal of education has key implications for teaching. This includes a desire for instruction to go beyond acquiring basic factual knowledge through to lower level cognitive processes such as memorizing, recalling or recognizing (Mayer, 2002). Effective teaching therefore must include teachers themselves knowing student's prior knowledge, the learning content, and strategies to challenge and support them to learn well (National Council of Teachers of Mathematics, 2000).

The Bloom's Taxonomy of educational objectives (Bloom, 1956; Anderson, et al., 2001) is one of the important resources available to teachers in their quest to take learning beyond the rote learning level. Although the original version (Bloom, 1956) was developed by measurement experts with a primary aim of developing better educational tests, Bloom viewed it as more than a measurement tool. Bloom understood, among other things, that the Original Taxonomy (OT) could be used for purposes such as being a common language about learning goals (Krathwohl, 2002). However, analyses of its use revealed a heavy focus on the recall and recognition of knowledge (ibid).

Bumen (2007) identified some advantages of using the Revised Taxonomy (RT) to align lessons. In her study, findings suggested that lesson plans of pre-service teachers in the experimental group who used the RT in the planning were judged as more effective compared to the control group. The findings also indicated that lesson plans prepared via RT confirm the realization of the curriculum alignment. However, it was also found that pre-service teachers faced difficulty in writing learning objectives in the metacognitive knowledge dimension. Bumen (2007) suggests that the RT and the concept of metacognition should take place during the in-service and pre-service teacher education curricula. The

study reported here follows from the proposals put forward by Bumen (2007) who advocates a greater need for investigating the effects of RT on planning, teaching and assessment.

This study investigated prospective teachers' understanding of the revised version of the Taxonomy and how they use it. Twenty prospective mathematics teachers participated, over three related phases. This aim of exploring teachers' understandings of the RT was pursued by allowing the pre-service teachers to use the RT during a mathematics teaching methods course. An implicit aim was to investigate prospective teachers' cognizance of learning objectives aimed at the higher end of the cognitive processes continuum, including the novel category added in the knowledge dimension of the RT. Mayer (2002) argues that while educators are quite comfortable creating and using lesson objectives aimed at the retention level, they face many difficulties when creating and using objectives aimed at promoting transfer of knowledge. Mayer adds that the Revised Taxonomy is intended to help users broaden their range of selecting objectives to include more at the higher order level, which are aimed to help in transfer of learning rather than a mere retention of information.

In light of the above issues, the following research questions are addressed in this paper: (i) how well do secondary pre-service mathematics teachers understand and use the Taxonomy Table (TT) to classify learning objectives? (ii) what are secondary pre-service mathematics teachers' opinions about the usefulness of the TT?

The current study is important because it adds to our understanding of how prospective teachers see knowledge and cognitive process dimensions. Such findings have implications in the professional development of teachers. After a brief review of the Original Taxonomy, a short discussion on the Revised Taxonomy is presented. This is followed by a review of some background literature. We then report on the specific details of this study that include the research methods, results and discussion. Finally, some implications are outlined.

The Original Taxonomy (OT)

The original Bloom's Taxonomy (Bloom, 1956) (hereafter referred to as original Taxonomy, or OT) provided a useful framework for classifying learning objectives under six major categories (Mehrens & Lehmann, 1991; Krathwohl, 2002). The categories are *Knowledge*, *Comprehension*, *Application*, *Analysis*, *Synthesis*, and *Evaluation*. The OT was considered hierarchical, which meant that *Knowledge* category was seen as the lowest level of learning, and a prerequisite for other categories of learning. All the categories (except *Application*) had sub-categories. For example, for the *Knowledge* category, there were three sub-categories: *knowledge of specifics*, *knowledge of ways and means of dealing with specifics*, and *knowledge of universals and abstractions in a field*. *Comprehension* comprised *translation*, *interpretation* and *extrapolation*. *Knowledge* was defined as remembering previously learned material. *Comprehension* built on *Knowledge* and involved understanding the material rather than remembering. *Application* dealt with using the learnt material in a new situation. As easily seen, *Application* would require some degree of *Knowledge* and *Comprehension* as well. At the fourth level was *Analysis*, which meant breaking down material into specific parts and noting how each were related. *Synthesis* involved putting back the elements together to form a whole. The final category was *Evaluation*. This, being the most complex of all, involved judging the merit of the material for any given purpose (Mehrens & Lehmann, 1991; Krathwohl, 2002).

The use of the old Taxonomy was common in assessment texts, reflecting its original intended purpose as a tool to achieve equivalence in the educational measurement and testing arena. The focus was mainly on writing good learning objectives denoted by the use of appropriate verbs. From our experience of working with pre-service teachers, understanding the verbs alone can be problematic in thinking about transfer of learning instead of simple retention of learning. Pre-service teachers, including novice practicing teachers often see a table of verbs and take for granted that a particular verb is to be used to signify learning at a particular level. For example, the verb ‘distinguish’ could be taken at a higher level (*Analysis*, for example, distinguish between the relevant and irrelevant numbers in a data set) and also at a lower level (*Comprehension*, for example, distinguish between like and unlike terms) depending on the requirement of the task at hand. The revised Taxonomy (hereafter referred to as the revised Taxonomy or RT), with the inclusion of a separate Knowledge Dimension, could prove helpful in clarifying the distinct intensions of learning objectives in a given subject domain, as discussed next.

The Revised Taxonomy (RT)

The revised Bloom’s Taxonomy (Anderson, et al., 2001) includes two dimensions – the Knowledge Dimension and the Cognitive Process Dimension (Waugh & Gronlund, 2009). According to Krathwohl (2002), objectives under the revised Taxonomy are framed in a way that captures both the content and the cognitive process dimensions. (See table 1). These are presented and discussed next.

The Knowledge Dimension

This dimension in the revised Taxonomy is actually a refinement of the *Knowledge* category (the first category and its three sub-categories) of the original Taxonomy. The fourth category under the Knowledge Dimension in the revised Taxonomy is the newest addition and is named Metacognitive Knowledge. The definitions, after Krathwohl (2002, p. 214) and Pintrich (2002) are presented. We provide simple examples of addition from mathematics to help explain the Knowledge Dimension:

A. Factual knowledge – The basic elements that students must know to be acquainted with a discipline and solve problems within it.

Aa. Knowledge of terminology e.g., what is addition?

Ab. Knowledge of specific details and elements e.g., what is the symbol for addition?

B. Conceptual knowledge – The interrelationships among the basic elements within a larger structure that enable them to function together.

Ba. Knowledge of classifications and categories e.g. what is the relationship between addition and subtraction?

Bb. Knowledge of principles and generalisations e.g. will addition always result in a bigger answer?

Bc. Knowledge of theories, models, and structures e.g. what is the commutative law of addition (theorem)?

C. Procedural knowledge – How to do something; methods of inquiry, criteria for using skills, algorithms, techniques, and methods.

Ca. Knowledge of subject-specific skills and algorithms e.g., how to add $15 + 1$ and $15 + 9$.

Cb. Knowledge of subject-specific techniques and methods e.g. $15 + 9$ is same as $(15 + 10)$ minus 1.

Cc. Knowledge of criteria for determining when to use appropriate procedures e.g., what to use if asked, 'there are two birds on a tree – two more birds join – how many birds are there now?'

D. Metacognitive knowledge – knowledge of cognition in general as well as awareness and knowledge of one's own cognition.

Da. Strategic knowledge – knowledge of general strategies for learning, thinking and problem solving (Pintrich, 2002, p. 220). For example, does the student know that he or she knows the Commutative Law of Addition? If no, what learning strategies might the student use to learn this law?

Db. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge – understandings that some tasks can be easy or difficult, and that difficult ones would require more thinking and different strategies, including culturally appropriate ones (Pintrich, 2002). For example, $10 + 10$ is easier than adding $15 + 17$, or using the idea of a dozen coconuts to make addition of twelves sound meaningful.

Dc. Self-knowledge – includes knowledge of one's strengths and weaknesses (Pintrich, 2002, p. 221). This includes knowing when you don't know something. It also includes motivation factors such as self-efficacy. For example, 'I am capable of adding two-digit numbers,' but 'I need to work on my speed at counting'.

The knowledge dimension is an important part of the revised Taxonomy because it can help the user to focus more specifically on the content while creating learning objectives. It is intended to provide a useful framework for making sense of the curriculum content from a teacher's perspective. As pointed out by the examples related to addition, there are a number of transactions one can carry within a simple topic such as addition. The benefits of the Knowledge Dimension become apparent when it is placed in a two-way table format (refer to table 1). For example, users could create or classify objectives at different levels of each Dimension, such as 'remember factual knowledge'; 'understand conceptual knowledge'; 'apply procedural knowledge' or any other of the 24 ideal combinations. Apart from this, the inclusion of metacognitive knowledge at its least would make teachers realize the importance of this often-neglected area of learning (Waugh & Gronlund, 2009; Krathwohl, 2002; Pintrich, 2002). Teachers could include more self-assessment ideas in their instruction to enhance students' metacognitive skills. It must be noted that every single teaching-learning activity that goes inside the classroom can have some sort of effect on a child's metacognitive knowledge. In other words, metacognitive knowledge can be treated as something closely tied to the other three categories of knowledge.

The Cognitive Process Dimension

Similar to the original Taxonomy, the revised Taxonomy also has six levels indicating the different, hierarchical dimensions. The first level is termed *Remember* (Knowledge in the OT) and includes retrieving relevant knowledge from long-term memory. It has two sub-levels: recognizing and recalling. The second level is *Understand* (Comprehension in the OT) and includes determining the meaning of

instructional messages, including oral, written, and graphic communication. It has seven sub-levels: interpreting, exemplifying, classifying, summarizing, inferring, comparing and explaining. *Apply* (Application in the OT) involves carrying out a procedure in a given situation, at the third level. It has two sub-levels: executing and implementing. At the fourth level in the revised Taxonomy is *Analyze* (Analysis in the OT). This includes breaking material into its constituent parts and detecting how the parts relate to one another and to an overall structure or purpose. Its three sub-levels are: differentiating, organizing and attributing. The second highest level is *Evaluate* (Synthesis in the OT). This refers to making judgments based on criteria and standards, and has two sub-levels, checking and critiquing. The upper most level in the revised Taxonomy is *Create* and includes putting elements together to form a novel, coherent whole or make an original product. It has three sub-levels: generating, planning and producing. Synthesis (in the OT) changed places with Evaluation but was renamed *Create* (Krathwohl, 2002).

The Revised Taxonomy (RT) and its Implications for Instruction and Assessment

The revised Taxonomy's use in education is multiple. Three important areas are discussed in this section. These include using the revised Taxonomy to: improve instruction; enhance motivation of learners, and; develop and use better assessments.

Starting with improving instruction, Rath (2002) offers two practical ways in which teachers can use the revised Taxonomy. The first suggestion involves using the revised Taxonomy as a guide to align lesson objectives, teaching and learning activities, and assessment. Teachers need to distinguish between learning objectives and activities. Often times, the learning activities or tasks, instead of the learning objectives, become the focus of teaching. This can be disadvantageous because teachers may get carried away with the demands of the activity or task and may overlook what the learning objectives were. This shortfall may be avoided if the learning activities are closely aligned to the big mathematical idea(s) presented in the lesson objectives. In short, the learning activities or tasks, and assessments must be guided by the learning objective(s) (Anderson, 2002; Payne, 2003; Rath, 2002; Waugh & Gronlund, 2009). This is supported by Byrd (2002, p. 245) who argues that the important question for teachers to ask is, 'what are students expected to learn?'

Rath's second suggestion is related to use of the revised Taxonomy to raise learning targets of instruction. Research suggests that teachers are too occupied with using learning objectives at the lower level, that is, at the *Remember* level (Rath, 2002; Waugh & Gronlund, 2009). It is not that remembering is of no use; rather, 'it is not sufficient for being a truly educated person,' (Rath, 2002, p. 235). Therefore, teachers must focus on more complex learning objectives. The revised Taxonomy, given its dual-dimension, provides greater possibilities for teachers to focus and choose objectives at varied levels. With respect to improving instruction, Rath (2002, p. 233) argues that, 'if the complexity of the objectives addressed increases across lessons or units, all things being equal, then one might infer that instruction has improved.'

Effective use of the revised Taxonomy has important connections to student motivation. The Taxonomy provides the scope for the teacher to move beyond the three conventional academic types of knowledge and accommodate objectives that target metacognitive knowledge. The metacognitive category is the newest category in the Knowledge Dimension of the revised Taxonomy and it can be used to, 'connect students to academic learning,' (Rath, 2002, p. 235). A focus on metacognitive

knowledge could help students become, 'more knowledgeable of and responsible for their own cognition and thinking,' (Pintrich, 2002, p. 219). According to Pintrich (2002), metacognitive knowledge must be taught in an explicit style whenever possible. On other occasions, this knowledge should be embedded in the content material. Waugh and Gronlund (2009) argue that this area of learning has often been overlooked by teachers.

Another implication for the use of the revised Taxonomy deals with assessing student learning. As pointed out by Waugh and Gronlund (2009), allowing students the necessary time to reflect on their own learning, including reflecting on what strategies work best for them, is an important area of learning. This area must be addressed by providing students the right opportunities to engage in learning and assessment. One specific area of assessment suggested could be the use of portfolios.

Apart from providing an opening for use of varied assessment approaches, such as portfolios, the revised Taxonomy is helpful when used to align the learning objectives with the assessment tasks. The revised Taxonomy allows for both formative and summative assessments to be used. For example, by combining formative and summative assessments, different levels of learning objectives can be aligned with a range of assessments (Ferguson, 2002). Concurring with this, Airasian and Miranda (2002), state that the revised Taxonomy not only allows for assessment to go beyond the Remember level objectives, but it also provides a way of understanding a wide array of assessment models and approaches. They argue that it also reiterates the call for different types of assessment for different types of objectives, including similar ones for similar types of objectives.

Methodology

This study draws on Kieran, Karabiner, and Shaughnessy's suggestion to include teachers as (co-) producers of professional knowledge where teachers are regarded as experts on 'students' subject-related learning,' (2013, p. 367). Although we were dealing with pre-service teachers, this perspective had important implications for the study's design because teachers as (co-) producers of professional knowledge emphasizes the need to provide opportunities for collaborative practice amongst teachers, and also between teachers and researchers. This study used three tasks designed to explore the participating teachers' understanding of the RT.

Participants

The participants in the study included 20 pre-service secondary teachers from Fiji who were enrolled in a secondary mathematics teaching methods course at a university in Fiji. There were 15 male and five female teachers. The teaching methods course was offered in the Online Mode, with two hours of face-to-face contact through a weekly workshop. The pre-service participants were full-time university students enrolled in a four-year Bachelor of Science and Graduate Certificate in Education programme, and in their third year of study. Everyone had mathematics as one of their teaching majors, with second majors mainly as physics, computer science, science or technology. The participants were informed of the study's aims and all of them agreed to be part of this study.

Instruments and Participant Preparation

As part of the requirements of the course, these pre-service teachers had to participate in weekly face to face workshop (tutorial) sessions, which lasted for two hours. In the first workshop session, these

teachers were introduced to the workshop content by the first author who was the mathematics workshop coordinator. Elements of this study were part of weeks three, four and five of the workshops. The study developed in three interrelated phases, described briefly as follows:

Phase 1

During the week three workshop session, the participants were introduced to the Years 11 and 12 Mathematics Syllabi (Ministry of Education, 2014). Each student was given a print copy of the Syllabi. They were asked to work in groups of four discussing their understanding of the Syllabi. The following questions were used to guide this workshop session: what parts of the Syllabi are you able to understand? Which parts are not clear? Do you have any other comments regarding the Years 11 and 12 Syllabi?

The authors were of the view that pre-service teachers would need to have a thorough understanding of the Mathematics Syllabi in order to use the Taxonomy Table (hereafter TT). One reason for the focus on Years 11 and 12 Syllabi was that graduate mathematics teachers are often expected to teach at the upper secondary level. The upper secondary level in Fiji covers Years 11 – 13. This activity set the workshop sessions in motion. During a short discussion towards the end of our week three workshop, all the pre-service teachers reported that they were able to understand the Mathematics Syllabi. The following response from one of the groups summed up the general mood of confidence among the pre-service teachers.

We believe that the Year 11 and 12 Syllabi is well organized. The topics are clearly organized under Year 11 and then under Year 12. The learning progression is summarized on page 7 so that we young teachers can see how learning progresses from Years 9 – 12. The topics and learning objectives are all clearly written.

Apart from a few questions (such as, what do the terms ‘strand’ and ‘sub-strand’ mean? Is Calculus now part of Year 11?), the pre-service teachers said that they would be able to easily use these Syllabi in their classrooms.

Phase 2

We introduced the revised Bloom’s Taxonomy to the group knowing that the use of the RT would provide a reasonable tool for pre-service teachers to interact with the Mathematics Syllabi, and especially with the learning objectives in a meaningful way. This was done in two parts; part one focused on the Knowledge Dimension (KD) and the second part was related to the Cognitive Process Dimension (CPD). After almost 30 minutes of explaining the KD and CPD using notes and examples (similar to what is presented in the preceding sections of this article), the participants were asked to do two activities individually. The participants were given additional readings (Krathwohl, 2002), uploaded on their online learning platform. An additional set of examples with detailed explanations on the RT was distributed (taken from Waugh & Gronlund, 2009, p. 223 – 226).

Activity 1

This required participants to use their knowledge gained from the previous week’s study of the Years 11 and 12 Mathematics Syllabi and list examples of each type of knowledge under these categories: Factual (A), Conceptual (B), Procedural (C), and Metacognitive (D). In order to limit the range of answers, we

asked the participants to give examples only from Year 11 Algebra in a tabular form. The participants were asked to give general comments at the end of this activity regarding how they found the activity of classifying different types of knowledge. Participants were given at least 30 minutes to give one example each of the four dimensions of knowledge. Their completed forms were collected for analysis.

Activity 2

The participants were then distributed a second form which contained a similar table containing six columns representing the six levels of the revised CPD (*Remember* as column one...*Create* as column six). Participants were required to give at least one example of each level under the CPD from Year 11 Algebra. They were allowed more than 30 minutes to complete this task individually. Their forms were collected for analysis. The results of the two activities are not part of this article. However, the two activities were seen to be important in terms of preparing the pre-service teachers to engage with the next task.

Phase 3

Having covered both the dimensions of the RT on separate activity sheets, the two dimensions were put together to form the TT (see Table 1). The TT forms a 4 x 6 grid, with KD as rows and CPD as columns. We gave the participants, who were working in groups of four, four learning objectives (LO 1 – LO 4) and asked them to place the LOs in the appropriate cell and justify their placements. At the end of this activity sheet, there were three open ended items seeking general opinions on the usefulness of the TT. These questions included: Were the group members able to understand and use the TT to classify the LOs; What aspects of the TT were useful in making sense of the of the LOs, and; Where there any aspects of the TT that was not perceived as useful from a prospective teacher's perspective? The decision to have them work in groups was due to anticipation that the group activity would allow participants the space to open up and discuss freely.

All the LOs were purposively chosen from the Year 11 Mathematics Syllabus to reflect some degree of variance with respect to the KD (A to D) and the CPD. That is, we did not want the LOs to end up in the same cell. There were two LOs from *Algebra* and two from *Statistics*. Only four LOs were chosen because of time limitations. Before they began the group activity, a worked example was presented to the group:

Example: Students should be able to simplify algebraic expressions.

Discussion: This statement, as it is, can mean different things to different people. So, let us put it into a specific context. Let us use notes under the 'Scope and content' column (see p.g. 11, column 4, bullet point # 4 of the Syllabi) to think of a relevant context in which we want this objective to sit. We select, for example, simplification using multiplication. An example would be: Expand and simplify $(x + 2)(x + 3)$. Next, we think of what type of Knowledge (A, B, C, or D) will be required by the learners in expanding and simplifying [list some skills like: multiplying x with $(x + 3)$ and 2 with $(x + 3)$; combining (adding) like terms]. So, learners are expected to use procedural knowledge (C) [Cb – Knowledge of subject-specific techniques and methods]. Now, have a look at the Cognitive Process Dimension and locate the verb in the LO. Expand is one verb, the other is simplify. The learners would be executing a procedure and it

falls under Apply [Although there are some links to Remember and Understand, we classify it at the highest level]. Therefore, we place our LO (example) in Cell C3.

Table 1: Using the TT to classify a LO

The Knowledge Dimension	The Cognitive Process Dimension					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. Factual Knowledge						
B. Conceptual Knowledge						
C. Procedural Knowledge						
D. Metacognitive Knowledge						

The LOs for group discussion were:

LO 1: Students should be able to define statistical terms.

LO 2: Students should be able to describe matrix properties.

LO 3: Students should be able to factorize algebraic expressions

LO 4: Students should be able to examine careers related to statistics.

The group presentations were done item by item. All presentations were audio recorded and the groups' hard copy presentations were collected. The hard copy answers, worked examples and reasons were read item by item (for example, LO 1 for each group) by both the authors. This was followed by listening of the groups' audio. We paid particular attention to: (i) the groups' classification and reasons on both the written and the audio versions, (ii) questioning by other group members and the presenting group's responses to such questions, and (iii) any explicit confusions or difficulties the groups reportedly faced while dealing with each LO. The results, based on the four LOs, are presented first, followed by their perceptions of the usefulness of the TT.

Results

LO 1: Students should be able to define statistical terms.

All five groups placed this LO in cell A1. They defended their placement by arguing that the content part was 'statistical terms' and this belonged to factual knowledge dimension. They could easily relate the content to 'knowledge of terminology'. None of the groups gave any examples of terms, indicating that any statistical term would fall under factual category's first sub-category (Aa – knowledge of terminology). With respect to the CPD, all the groups agreed that the verb 'define' would require recognizing or recalling relevant knowledge from long term memory, hence they placed it under Remember. Extracts from two of the group presentations were:

Our group has placed it in A1 which is factual knowledge and remember. Like students need to recall definitions of statistical terms and definitions are regarded as

facts as meanings cannot be altered. Therefore, we have classified it under cell A1 (Group 1).

Our group has chosen A1. Our reason is that statistical terms are factual knowledge and define means students should be able to remember them (Group 5).

LO 2: Students should be able to describe matrix properties.

With respect to the knowledge part in this LO, four of the groups (Groups 2, 3, 4, & 5) classified this objective as Factual (A) under the KD. Their reasoning was, 'Matrix properties are facts and we think it will come under Factual (Ab) which means knowledge of specific details and elements' (Group 2). Group 4 argued that, 'matrix properties is always factual – facts – because matrix properties will never change, therefore we classified it as Factual Knowledge.' Only Group 1 had a different classification – they argued that matrix properties are Conceptual Knowledge. They reasoned that in order to know the properties, students must know the concepts. For them, this meant that matrix properties belong to Conceptual Knowledge.

With respect to the CPD, three out of the four groups (Groups 1, 3 & 5) that had classified this LO as Factual placed it under Remember (Cell A1). The three groups believed that describing matrix properties would involve remembering the definitions of terms, hence they placed it at the Remember level. Group 4, having classified it as Factual Knowledge, had placed it as Understand (Cell A2). Group 1 also classified it as Understand (Cell B2). Groups 1 and 4 argued that in order to describe matrix properties, it was not sufficient for students to remember – they would need to go a step further and understand the matrix properties.

LO 3: Students should be able to factorize algebraic expressions.

Four out of the five groups classified this learning objective into Cell C3. The groups argued that factorizing algebraic expressions at Year 11 level would require students to apply procedures such as factorizing by grouping or factorizing by using the difference of two squares. All four groups gave examples of factorizing such as factorizing $x^2 + 5x + 6$ (Group 1) or $x^2 + 2x + 3$ (Group 3) which are commonly taught at Year 11. The groups argued that:

It is procedural knowledge because we need to know the factors of 6 and use that information to look for two factors of 6 which add to give 5. So it is Apply. Therefore, we classify it in Cell C3. We also think that it includes some remember because students need to be able to remember factors of 6. Once they know the factors of 6 which add to give 5, they need to write it as $(x + 3)(x + 2)$. (Group 1)

Our group classified it at C3 because factorize itself is a method. So factorizing means applying skills or methods. (Group 3)

Upon one of the participants questioning whether looking for factors of the constant involved the conceptual domain, or was it procedural, the groups agreed that finding factors involved conceptual knowledge, but factorizing involved more than finding the factors of the constant. Hence, the four groups defended their classification by saying that the highest level of KD involved in factorizing was Level C, that is, procedural. This indicated that the participants viewed the KD as hierarchical.

One of the groups (Group 4) had a different classification. This group classified the LO 3 into cell C5. Their justification was as follows:

We decided it should go in cell C5. We agree with other three groups that factorizing is procedural knowledge. But, we think it should go under Evaluate. This is because there are different methods of factorizing so students need to decide which method will be most suitable. They will be given a question on factorize and if the question just says 'factorize' without suggesting the method or methods of factorizing, the first thing students will need to do is to decide or judge the best method(s) to use. So the highest level at which factorize could be classified is Evaluate.

The group presentations revealed that the participants could identify a procedural level objective. While there was some confusion between conceptual and procedural knowledge, all the groups saw the KD as hierarchical and classified this objective at the procedural level. The groups agreed that there was a certain degree of factual as well as conceptual knowledge involved in factorizing. For example, a Group 4 participant argued that looking for factors of 6 involved conceptual knowledge. Another participant from Group 1 had said that students would need to know what common factors of variables are as well.

While the groups agreed that factorizing involved procedural knowledge under the KD, there was some confusion with respect to the CPD classification. Four of the five groups said that the highest level would be Apply, while agreeing that there were various levels of Remember and Understand within Apply. For example, students would remember factors of 6 or 3, or remember simple arithmetic such as 2 times 3 equals 6 and 2 plus 3 equals 5 (as in case of Group 1's example of $x^2 + 5x + 6$). One group had a different classification of the same objective (Group 4). Their reasoning was supported by an example which made sense (Factorize $x^3 - 4x$). This group believed that students would be required to decide first on what procedure(s) to use. This was because the question did not make explicit the procedure(s) for factorizing. The group claimed that if the question had asked to use an explicit procedure, such as difference of two squares, then they would be happy to classify it at Apply level. In the absence of an explicit method, the group maintained that this objective would be at the Evaluate level.

LO 4: Students should be able to examine careers related to statistics.

All the groups had classified this LO as Metacognitive Knowledge under the KD. Similarly, all (Except Group 4) the groups agreed that the LO should be placed at level 5 (Evaluate) under the CPD. Excerpts from group presentations explain this:

Our group members see this objective as metacognitive knowledge. This is because students will need to relate knowledge gained from statistics to real life situations and do a short survey, or find out, what careers related to statistics there are and which career they like the most. Which are some of the fields that use statistical knowledge and evaluate which field is best for them in terms of their career path. Metacognitive because they will discover their likes and dislikes about statistics as a field. Evaluate because examining is a form of evaluating as well – deciding which career path is the best. That's the reason we classify it in Cell D5 (Group 1).

Students will have to examine careers by themselves and they will have to make decisions by themselves. They will decide on their own to choose which career path they want to go on so that will come under evaluate because they will be judging different careers (Group 3).

Group 4 said that while they knew this objective belonged to the Metacognitive category (D), however, they were initially not sure where to place it under the CPD. However, after listening to three preceding groups' explanations, this group indicated that they would agree with the D5 classification. The following table captures how the groups classified each LO.

Table 2: Groups' classification of the four LOs.

Group Number	Learning Objectives (LOs)			
	LO 1	LO 2	LO3	LO4
1	A1	B2	C3	D5
2	A1	A1	C3	D5
3	A1	A1	C3	D5
4	A1	A2	C5	D5
5	A1	A1	C3	D5

Teachers' Opinions about the Usefulness of the TT

At the end of the classification activity, groups were asked to record their opinions of the usefulness of the TT. All the groups said that they were generally able to understand and use the TT. They did not report any major difficulty with the use of the TT per se, except for one group (Group 4) which said that they could not understand fully the Metacognitive Knowledge category under the KD and Create under the CPD. They claimed that it is quite difficult to think of examples of these in mathematics. However, individual groups reported distinguishable issues not directly associated with the TT. One of the groups (Group 3) claimed that some of the LOs were not clearly presented in the Syllabus, which made the classification difficult. This group gave an example of an LO from the Syllabus (students should be able to present data). In their view, if the nature of data was known, then only a particular LO can be classified in the correct cell. Three of the groups (Groups 1, 3 & 5) said that, at times, the LOs could be classified into more than one cell due to the obscure nature of some of the LOs. Group 2 gave an example of how objectives needed to be further split in order to be understood properly. They said, 'solving quadratic equations can be broken down into solving perfect square quadratic equations, solving difference of 2 squares quadratic equations and so forth'.

On the whole, the groups found the TT easy to use. Their responses about its usefulness included reactions such as: 'the TT is useful to teachers because it helps teachers understand what the objectives mean and once we understand what an objective means, we get a clear idea of how to teach that objective to the class,' (Group 2); 'the TT is not only helpful in understanding and classifying the LOs, it is also useful in preparing new learning outcomes.' (Group 5); 'it can help teachers in aligning their teaching, everything rests on the objectives, so if they are properly understood then teachers can align their activities and assessments.' (Group 1).

Discussion and Conclusion

In this study, we explored whether pre-service mathematics teachers could understand and use the Taxonomy Table. We used a set of learning objectives from the National Mathematics Syllabi to pursue our aims. Our study was rooted in the context of pre-service teacher training and participants were provided as much practice as possible prior to the study. In this way, we remained committed to providing our sample of pre-service teachers an opportunity to be (co-) producers of knowledge.

The findings of the study reveal that our group of pre-service teachers, when given adequate support, were able to understand and use the revised Bloom's Taxonomy Table. In other words, the pre-service participants in our study were able to classify learning objectives at an acceptable level. Three out of the four LOs were intended to represent the higher-order learning objectives, and it is promising that pre-service teachers in this study were able to make sense of learning objectives targeting the transfer of learning, rather than retention. It would be reasonable to believe that the workshop activities preceding the main activity would have provided a basis for understanding the Taxonomy Table. All the groups in our study spoke in favor of the Taxonomy Table as an effective tool for mathematics teachers.

However, there was a certain degree of complexity in understanding learning objectives which became evident when our participants dealt with second and third learning objectives (LO 2 and LO 3). We noted how the classification of LO 2 and LO 3 revealed some degree of variance in pre-service participants' views. We believe that such disparate conceptions are important because it helps pre-service teachers go beyond the TT and question how the LOs are framed. This becomes an important finding of our study, that the TT can be used to explore teachers' beliefs and understandings about other interconnected issues. Generally speaking, LOs which form part of any national syllabus are too broad. This is mainly because of space limitations. Teachers are left to interpret these at the correct level, depending on the Year level they are teaching or the academic ability of the cohort they are teaching. Broad LOs can mean different things to different teachers. We speculate that those who presume a particular LO at a lower level would likely teach it at that level. However, further research is needed to substantiate this claim. This is one area in which more attention is required during pre-service teacher training.

Despite the perceived vagueness of some of the LOs, some of the pre-service teachers were able to deal with even broadly stated LOs. For example, some of the group's declaration that a particular LO could be classified at different levels confirmed this. From this, we can conclude that the TT becomes an important tool for the teachers when examining LOs.

Another important point worth mentioning is the supposedly hierarchical nature of the KD. While all categories of knowledge are important in mathematical learning, there is a danger that pre-service teachers might fancy procedural knowledge in favor of the other two preceding categories. This is another place where special care must be noted during pre-service mathematics teacher preparation.

One other important feature of this study is that a majority of the pre-service teachers were able to categorize the metacognitive knowledge example (LO 4), contrary to past studies such as Mayer (2002) and Bumen (2007), which claimed that teachers are generally not comfortable while developing and working with objectives unlike those at the retention level. This study, however, revealed how one group of pre-service teachers explicitly said that they had little comprehension of Metacognitive Knowledge. Metacognitive Knowledge is one area which is increasingly being seen as important for

students as well as teachers (National Research Council, 2000; 2001). Although not explicitly mentioned, one group of participants [Group four; LO 3] did say that learners would be required to choose the best methods to solve a particular equation. Such arguments confirm that metacognitive knowledge is a broad category, intertwined with other categories of knowledge, and could be present in a tacit form in any LO. Metacognitive Knowledge is one area worth considering in future studies.

One of the limitations of the study is related to the smallness of the sample. Our experience informs us that usually a small number of Fijian pre-service teachers take up mathematics as a teaching subject major. A second limitation of our study could be related to the nature of data collected. The participants were in their third year of university study and had no experience at teaching mathematics. This could mean some degree of hesitance to share the limited knowledge and expertise they had. Another limitation of our study is that we could concentrate only on a few of the 24 cells in the revised Taxonomy. Based on these limitations, we cannot make any generalizations about pre-service teachers' or even practicing teachers' understanding and use of the Taxonomy Table among the wider Fijian mathematics community.

We are optimistic that our study will enlighten the wider mathematics education community to carry out further studies on an area where there is a dearth of research. We agree that encouraging teachers to understand and use Taxonomy Table could open up, 'a panorama of a wide range of educational possibilities,' (Krathwohl, 2002, p. 212) for teacher development. Finally, we believe that considering teachers as (co-) producers of knowledge is a fruitful alternative.

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Formative or Summative?

How Pre-service and Practicing Teachers View Forms of Assessment

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Abstract

According to research, teachers can and do hold multiple beliefs about assessment, which can be classified into two general categories distinguished by the major purposes of assessment. The beliefs of twenty-three pre-service and thirty-three in-service Pacific Island teachers were explored using seven open-ended items. Findings indicate that a majority of each group explicitly prefers formative assessments. Recommendations suggest exploration of teacher beliefs using novel methodologies within various cultural contexts, including exploring the possible alignment of beliefs and practices.

Introduction

Much attention in educational research for more than two decades has revolved around the problematic question of the influence of teachers' beliefs on various aspects of education, not least in the area of teaching–learning–assessment relationships (Schraw & Olafson, 2015). Despite the inconsistencies in various experts' definitions of the term 'beliefs' their importance is undeniable because 'teachers frequently rely on beliefs,' (Gill & Fives, 2015, p.1) in carrying out their instructional work. For example, Fives, Lacatena and Gerard (2015, p. 249) state:

beliefs about teaching and learning may be at the forefront of teachers' work and as such serve as filters, frames, and guides for teacher practice including: engagement in professional learning experiences, instructional planning, and classroom interactions.

Although there does exist some evidence of inconsistencies between teachers' epistemological and instructional beliefs and their classroom practices (Phillipp, 2007; Raymond, 1997), a vast majority of findings noting varying degrees of consistency between teachers' beliefs and their classroom practice (Thompson, 1992; Beswick, 2012) has ensured that teacher beliefs persist as one of the critical areas for teacher education researchers (Francis, Rapacki, & Ayfer, 2015; Rubie-Davies, 2015).

Two terms, beliefs and conceptions, have been used to describe the construct under study in this area of research. That the terms have similar connotations led Thompson (1992) to use both in the title of her chapter, though without implying that they are interchangeable synonyms. She defined conceptions as a more, 'general mental structure, encompassing beliefs, meanings, concepts, propositions, rules, mental images, preferences, and the like.' (p. 130). In other words, Thompson's definition includes beliefs as a subset of conceptions. Beliefs can be distinguished from knowledge or facts because beliefs can be held with varying degrees of conviction (Thompson, 1992; Scott, 2015) and different people can hold different beliefs that would be extremely difficult to refute (Philipp, 2007; Scott, 2015). The same cannot be said for knowledge, because knowledge is, 'held with certainty,' (Philipp, 2007, p. 259). Buehl and Beck (2015), who maintain that beliefs are subjective, support this distinction between knowledge and

beliefs. Ashton (2015) also seems to support this distinction by claiming that beliefs rely predominantly on one's judgment and affect. Philipp (2007) argues that knowledge is, 'beliefs held with certainty,' (p.259). According to this understanding, it could likely be that beliefs may overlap with knowledge (Ashton, 2015). Philipp (2007) also describes beliefs as, 'lenses that affect one's view of some aspect of the world,' (p. 259). Brown (2003) defines conceptions as an, 'organizing framework by which an individual understands, responds to, and interacts with a phenomenon' (p. 3). Brown's understanding of the term conceptions seems similar to Philipp's understanding of the term beliefs, although Philipp (2007) argues that the two terms have not been used in a uniform way in the education literature. This study adopts Philipp's (2007) understanding of the term beliefs, which is supported by Thompson's (1992) distinctions of conviction and consensuality between beliefs and knowledge. Although the term conceptions has been widely used in studies involving assessment related notions of teachers (Brown, 2003, 2004; Barnes, Fives, & Dacey, 2015), this study opted for the term beliefs based on Philipp's articulation of the term.

This small study set out to explore pre-service and in-service primary and secondary teachers' beliefs about assessment. The fifty-six teachers enrolled in an undergraduate education course provided a sufficiently diverse sample of participants from six of the smaller island states in the South Pacific, including the Fiji Islands, home for the majority of the participants. Apart from ascertaining participants' own understandings of assessment, including intuitive beliefs about it, a wider aim was to do so by making use of two dominant paradigms of thought prevalent in the assessment beliefs literature. Given the relatively smaller sample size, and the uneven distribution of the sample across six of the diverse cultures of the South Pacific, no ethno-cultural analysis of the findings was possible; the study thus looked to providing an understanding based on two distinct groups, pre-service and in-service teachers. Despite the moderate imbalance of participant numbers between the two groups, this analysis provides a reasonable insight into the beliefs of each group. In the light of the relative importance of teachers' beliefs in explaining their classroom practice (Scott, 2015), and the limited, yet evolving, local literature on teacher beliefs (Dayal & Lingam, 2015), this study is important in terms of providing fresher insights into teachers' beliefs about assessment.

Theoretical Framework

Developments in cognitive psychology in recent decades have led to significant changes in how we teach and how we assess (Shepard, 2000; McMillan, 2013). The traditional, absolutist paradigm saw knowledge as consisting of certain and unchallengeable truths (Ernest, 1991; 2004), with profound implications for teaching, learning and assessment. The theory of learning associated with this view of knowledge promoted learning through practice and rote methods in pursuit of this treasure trove of unarguable knowledge. Transmission approaches to teaching were prevalent, with drill, but 'no frills' (Ernest, 1991, p. 138). The theory of assessing such learning often promoted the use of externally set tests and examinations (Ernest, 1991). Such a narrow view of assessment still prevails today and is classified as **summative**, culminating in a tower of 'bricks' or 'blocks' of knowledge acquired and stacked one atop the other to produce the authenticated image of the 'educated person'. The assessment exercise is conducted at the end of the learning segment and is regarded as certifying mastery (Booker, Bond, Sparrow & Swan, 2004). Such assessments give importance to a belief that right answers are possible and that only 'right' answers count, thus failing to give any importance to the ways in which the answers are arrived at or the depth with which they are understood. Such assessments, especially when

they come in the form of national examinations at the end of the school year, or end-of-semester university examinations, focus only on assigning marks or grades. Students who receive poor grades are easily discouraged, so their motivation for pursuing learning is quickly dampened (Booker et al., 2004). Viewed through such a lens, assessment is seen as a tool – most often in the form of a written test containing multiple-choice and or other short-answer items, which is administered and scored using standard procedures. For obvious reasons, this type of assessment process has often been referred to as ‘the testing culture’ (Gipps, 1994). Disadvantages of such assessments include predominant use of low-level recall questions, over-dependence on teacher judgments that may be inaccurate and unreliable, the risk that teachers will resort to ‘teaching to the test’, and the very real possibility of undesired impacts on students’ motivation (Moss, 2013; Abrams, Pedulla, & Madaus, 2003). It must be noted though that summative assessments, when used well by classroom teachers, could provide meaningful insights into students’ understanding (Popham, 2014).

The fallibilist philosophies of knowledge, on the other hand, see knowledge as socially constructed. They reject the view that knowledge be awarded an objective and non-negotiable status. The theories in support of this view of knowledge and learning are often grouped under the umbrella term of constructivism. One of the important tenets of learning theories falling under this heading is that knowledge is actively created and cannot possibly be transmitted directly from the head of one person to the head of another by use of words (Mousley, Clements, & Ellerton, 1992). In other words, knowledge cannot be given ready-made to students (Yackel, Cobb, & Wood, 1992). Viewed from the social-constructivists’ viewpoint, learning involves questioning, decision making and negotiation. Such a perspective of learning translates into teaching based on discussion, conflict and questioning of the content and pedagogy (Ernest, 2004). The implications of such a socio-constructivist view on teaching and learning strongly and directly challenge the traditional approaches of assessment (Shepard, 2000; Klenowski & Wyatt-Smith, 2014; Heritage, 2014). The goals viewed from a socio-constructivist perspective are to allow children to make meaningful constructions and to develop the ability to engage in explanation and argumentation. This contrasts with the goal of the traditional approach, which was linked to performance of specific tasks. Therefore, assessment from a socio-cultural perspective must not consist only of performances on single tasks; something more than that must take place. Judging students by looking at their written answers will fail (Popham, 2014).

As the traditional testing paradigm is no longer sufficient to make accurate judgments about students’ learning, educators have called for a shift in how we see assessment. This shift is represented by extending our understanding from assessment as a mere tool to assessment as a mindset (Filsecker & Kerres, 2012). Similarly, Gipps (1994) articulates this as a shift from the psychometric model to an assessment culture, while Shepard (2000) uses the term ‘emergent’ to capture changes in assessment viewed from the constructivists’ perspective. This emergent assessment culture is helpful in explaining the shift from summative to formative assessments. According to Filsecker & Kerres (2012, p. 3, [emphasis added]), ‘if we are closer to the emergent assessment culture, we will understand **formative** assessment as a set of practices intertwined with the ongoing actions during the teaching and learning process.’ Although Wiliam (2007) argues that assessment is independent of any view of learning, he is using a similar lens when he suggests that assessment is effective when it is viewed as a servant rather than a master. Educators, he argues, must look at assessing whatever is important, rather than making important what has been assessed. Assessing whatever is important aligns well with the emergent

paradigm of thought; making important what is assessed is, rather, parallel to the rigid nature of a summative assessment or a testing culture.

Focusing on the servant role of assessment, Wiliam (2007) argues that assessment can play a supporting role; for example, students can learn something as a result of engaging in assessment. Additionally, good assessments can make good teaching tools, and good teaching tools can make good assessments. Wiliam views assessment as 'a bridge' between teaching and learning by. 'helping teachers collect evidence about student achievement in order to adjust instruction to better meet student learning needs, in real time,' (2007, p. 1054). Wiliam's description of the servant role of assessment brings us to the new mindset of assessment, of actions that have proven to improve learning: (a) clarifying and sharing learning criteria intentions and criteria for success; (b) engineering effective classroom discussions, questions, and learning tasks that elicit evidence of learning; (c) providing feedback that moves learners to progress in their learning; (d) activating students as instructional resources for one another, and; (e) activating students as the owners of their own learning (Wiliam, 2007, p. 1054). The 'master' role of assessment, unlike the 'servant' role, implicitly suggests that whatever is assessed should be given utmost importance. This poses a potential danger in that teachers would resort to teaching to the test, ignoring important elements of the curriculum in the process.

This study made use of the two often opposing convictions of assessment to inquire about similarities and differences in pre-service and in-service teachers' notions of assessment. We used this distinction without any intent to suggest that one view was better than the other, although on a personal level we agree that the contemporary view of assessment provides a useful lens to acknowledge that both assessment types are not mutually exclusive. Having teachers reflect on summative and formative assessment characteristics could be useful not only in classifying their beliefs, but also in helping them scrutinise their own existing beliefs critically and becoming aware that there may be more than one lens of value in their developing understanding about what assessment is.

Literature Review

Research in the area of teachers' beliefs about assessment confirms that teachers hold the beliefs that assessment: improves teaching and learning; makes students accountable for their learning, and; keeps schools and teachers accountable for student learning. On the other hand, some teachers may see assessment as unimportant (Brown 2003, 2004; Brown & Hirschfeld 2007).

The first of these links to the idea of formative assessment and indeed, the five categories of formative assessment can be used, and have proven successful, in improving student learning (Wiliam, 2007). Harris (2008) closely links the next two on the list, student accountability and teacher accountability, to summative assessment practices. Finally comes the disconcerting opinion that assessment serves no meaningful purpose in the teaching and learning process, a claim based on the view that assessment results are unreliable and could in fact be derailing the motivation of teachers and students (Brown, 2003, 2004; Harris, 2008).

Harris (2008) explored the conceptions of assessment and feedback held by secondary school teachers in New Zealand. The small study, involving eleven teachers from four secondary schools, was qualitative in nature and used focus groups for data collection. The findings indicate that teachers saw three purposes of assessment: it improves student learning; it is a useful basis for reporting student performance to stakeholders and complying with school and ministry regulations; and it is detrimental

to student learning. The teachers did not mention the student accountability conception of assessment as reported by Brown's study. Instead, they took a high level of personal accountability for their students' failures and successes. They agreed that reporting was important, although unpleasant at times. Teachers argued that schools and teachers should be accountable to the stakeholders for student learning. The teachers also noted that the current external testing used to determine student results was unfair to certain students and often invalid and unreliable. All teachers held positive feelings about formative assessments while teacher-controlled summative assessment was viewed in slightly negative terms, and external summative assessment in extremely negative terms. The teachers also reported tensions in wanting to carry out formative assessment and being forced to use summative assessment for reporting and compliance purposes. Another important finding of this study was that most teachers saw formative and summative assessment as dichotomous. Perhaps this implies the need for more work to be done on ways of changing or developing teachers' views on how summative assessments could be used for formative purposes.

In a recent local study, Dayal and Lingam (2015) explored beliefs about assessment by asking participants to write reflections based on four prompts. The findings indicated that the majority of Fijian in-service teachers held an assessment **for** learning view while the majority of pre-service teachers held an assessment **of** learning view of assessment. Participants' responses also indicated that all of them rated assessment as important, whether for summative or formative reasons; none of the participants stated that assessment was irrelevant. Finally, when asked whether they supported the servant or the master role of assessment, the majority of the in-service participants said that assessment should target important areas of learning, agreeing that assessment must play a servant role in the instructional process. Almost a third of the pre-service teachers were of the view, aligning to the master role of assessment, that whatever gets assessed should be given importance.

Research has shown that teachers can simultaneously hold not only one but multiple beliefs about assessment (Brown, 2004). For example, Brown (2004) noted that teachers in New Zealand thought that assessment was important for improving teaching and learning as well as holding schools accountable for learning. In another study, Hui and Brown (2010) also noted that teachers in Hong Kong generally accepted that assessment tasks could improve learning, but some teachers were of the view that these tasks could serve accountability purposes as well. In another recent study by Smith, Hill, Cowie, and Gilmore (2014), pre-service teachers across New Zealand entered universities with an assessment *of* learning view of assessment. These teachers showed awareness of formative purposes of assessment while responding to the survey questionnaire. However, their responses to open-ended items revealed a belief represented by the summative role of assessment. The authors argue that teachers' personal school-based experiences with summative assessments could have dominated their thinking and emotions.

Because pre-service teachers have had experiences with assessment as students at the school level, as well as at university level, they may continue to hold conceptions of assessment that are similar to students' conceptions of assessment. Brown and Hirschfield (2007) report that studies carried out so far on students' conceptions of assessment reveal multiple yet conflicting conceptions. This may be due to students adjusting themselves to the views and preferences of their teachers, as they have little say in how assessments are to be carried out. The authors provide the following summary of students' conceptions of assessment: assessment is a negative thing because it is unfair, bad, or interfering to the students' learning; assessment, including classroom assessment, acts to make students themselves as

well as their teachers and schools accountable, and; assessment, or at least some formats or procedures, may be beneficial, or even enjoyable, in improving the quality of student learning. Smith et al. (2014) point out that although students experience a wide range of assessments during schooling, assessment is often viewed as an activity or an event. Pre-service teachers' beliefs about assessment could well resemble the beliefs students hold, given that they have had no experience as teachers. In their comparative study related to prospective teachers, Brown and Remesal (2012) found that New Zealand prospective teachers agreed more with the improvement conception of assessment. While New Zealand prospective teachers saw assessment as a tool for measuring school quality and student grades as well, prospective teachers from Spain saw assessment as bad.

Although Brown (2004) found that factors such as the roles teachers played, teacher characteristics such as years of experience, school characteristics such as schools' socio-economic status and school locality (urban or rural) were largely irrelevant to the teachers' conceptions of assessment, many other factors can affect the way in which teachers perceive assessments (Brown, Hui, Yu, & Kennedy, 2011; Brown & Remesal, 2012). According to McMillan (2010), a number of contextual factors could impact the way in which assessments are done. These include: classroom environments, socio-cultural differences, student ability and achievement, grade level, and the subject being taught. For example, Abrams et al. (2003) noted that teachers working in high-pressure assessment environments taught in a manner that could contradict their own beliefs about good educational practice. According to Brown et al. (2011), differences in culture and society can lead to different beliefs about assessment.

Although research in the area of teachers' beliefs about assessment has noted different belief segments, the findings, to a greater extent, have been consistent in terms of the beliefs about the purposes of assessment. Slight differences in findings could be related to the differing nature of the study designs. Harris and Brown (2010) agree that structured and relatively unstructured methods of data collection may not result in similar findings. Teachers' beliefs about assessment and the contextual factors under which they operate could be one area that warrants further exploration. Another area worth exploring would be teachers' beliefs about assessment and their knowledge, including knowledge of the content, pedagogical content knowledge, knowledge about learners, and assessment knowledge (Heritage, 2007). A final area, related to the current study, is the importance of studying beliefs of teachers from different societies. As Brown and Remesal (2012) point out, teachers' belief systems differ from one society to the other. The current study hopes to provide insights into teacher beliefs about assessment based on a small sample of teachers from South Pacific origins.

Method

Participants

The participants in this study included 56 teachers, of whom 23 were pre-service and 33 in-service teachers. The pre-service group was prospective secondary teachers, the majority of whom were in their third year of the four-year teacher training programme at a Fijian University. Six were males and 17 females, most of them from Fiji, with two each from Vanuatu and Kiribati. The in-service group, 13 males and 20 females, consisted of both primary and secondary teachers, 20 of them enrolled in the Bachelor of Education (BEd) Primary program, and 11 in the BEd Secondary program. (The BEd program is available only to teachers who hold a Diploma in Education qualification from a teacher training college and have had a minimum of two years of teaching experience at either the primary or secondary

level.) This group of teachers, who had, on average, taught for approximately seven years at the time of the study, represented six countries: Tonga (7); Solomon Islands (11); Kiribati (1); Vanuatu (2); Fiji (11); and Tuvalu (1). Overall, the study participants were from six different nations in the diverse South Pacific region. The participants were told that their responses would be used for research purposes and all of them agreed to participate by providing their responses to the beliefs questionnaire.

Table 1 – Participants

Pre-service Secondary Teachers (n = 23)	In-service Teachers (n = 33)	
	<i>BEd Primary (22)</i>	<i>BEd Secondary (11)</i>
Male = 6	Male = 9	Male = 4
Female = 17	Female = 13	Female = 7
Average years of teaching = Nil	Average years of teaching = 8.5	Average years of teaching = 3.5

Instrument

The participants were enrolled in a Curriculum Studies course during semester one of 2015. As part of the course, they participated in a one-hour lecture session on assessment, to introduce the basics of educational assessment. Because, at the time of the study, participants had not yet undertaken the core course on educational assessment as part of their program, though they would do so in their final year of study, elements of educational assessment were embedded in the Curriculum Studies course. Before the start of the lecture session, participants were asked to fill in a short questionnaire consisting of five open-ended items. The first three items were similar to the open-ended items recorded in *Revised Beliefs About Assessment Questionnaire* (Smith et al., 2014). The first three items aimed at eliciting participants’ initial understanding of assessment and feelings associated with it. Items four and five were added to seek their understanding of the terms *summative* and *formative* assessment. The first section of the beliefs questionnaire thus read:

1. What do you understand by the term assessment?
2. What comes to mind when you think of the term assessment?
3. How do you feel when you hear about or think of the term assessment?
4. Have you heard of the term summative assessment or assessment of learning? If yes, what do you understand by this?
5. Have you heard of the term formative assessment or assessment for learning? If yes, what do you understand by this?

Participants were then taken through a short presentation on summative and formative assessment using two power point slides of notes, one for each type of assessment. Table 2 captures the content of the coverage. The contents of the formative assessment power point slide were directly taken from Filsecker and Kerres (2012). The presentation was short and included only pinning the important terminology onto assessment phenomena that the participants may have already experienced,

understood, or held opinions about. This was done with care to ensure that the presentation did not create bias toward any one particular type of assessment.

Table 2: Summative and Formative Assessment

<p>Summative assessment</p> <ul style="list-style-type: none"> • Undertaken at the end of the course of instruction (e.g. end-of- year examination, Fiji Year 12 Examination) • Used for assigning grades or certifying mastery, or readiness to go the next level of schooling, tertiary enrolment, jobs, etc. • Mostly in the form of written tests or examinations • Focuses on accountability (How well have schools and teachers performed?)
<p>Formative assessment</p> <ul style="list-style-type: none"> • ‘... is concerned with how judgments about the quality of students’ responses can be used to shape and improve the student’s competence by short-circuiting the randomness and inefficiency of trial and error learning’ (Sadler, 1989, p.120). • ‘... all those activities undertaken by teachers, and/or by their students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged’ (Black & William, 1998, p. 7). • ‘... the process used by teachers and students to recognize and respond to student learning in order to enhance that learning, during the learning’ (Cowie & Bell, 1999, p.101). • ‘... assessment carried out during the instructional process for the purpose of improving teaching and learning’ (Shepard et al., 2005, p.275). • ‘An assessment is formative to the extent that information from the assessment is used, during the instructional segment in which the assessment occurred, to adjust instruction with the intent of better meeting the needs of the students assessed’ (Popham, 2006, p.3). • ‘The purpose of formative assessment is to provide feedback to teachers and students during the course of learning about the gap between students’ current and desired performance so that action can be taken to close the gap’ (Heritage, 2008, p. 2).

Towards the end of the lecture, participants were given the final page of the questionnaire, which contained items six and seven. The two items read as follows:

6. Having gone through the short discussion on summative and formative assessment, which one are you likely to support and why?
7. What is your thought about the other one?

The questionnaires were analysed qualitatively, question by question. The two groups were analysed separately to see whether pre-service teachers’ beliefs differed from their in-service counterparts. This distinction is used in the results presented below. Each pre-service participant’s questionnaire was coded using numbers one to twenty-three. This ID is reflected in the results and discussion section. In-

service teachers' responses were similarly coded. Given the smallness of the sample size, gender and country-wise analysis was not pursued.

Results and Discussion

Teachers' Initial Understanding of Assessment

Seventeen out of the 23 pre-service participants demonstrated an initial understanding of the term assessment that could be classified as reflecting a traditional or summative understanding of the concept. Typical responses of pre-service participants to items one and two were judged to reflect this view. For example, they gave responses such as grading, marking, evaluating, monitoring performance and testing level of understanding as their responses to item number one, and similar responses for item number two, including: *grades or marks attained* (Participant 2); *marking of scripts* (Participant 14); and *being tested* (Participant 19). Only six pre-service participants gave responses that were seen as reflecting a formative belief of assessment. Typical responses of this kind included: *assessment is about teaching methods, planning and presentation* (Participant 12) and; *assessment deals with getting feedback on concepts taught* (Participant 22).

Of the 33 in-service participants, 24 gave views that could be aligned with the summative functions of assessment, in responses similar to those of pre-service participants. Only nine out of the 33 teachers gave responses that could be classified as formative beliefs. For example, as Participant 4 wrote, *assessment is any method used to gauge what has been learnt and what to do in the next lesson*. For Participant 22, assessment meant *an evaluation of students and teaching strategies in teaching to better help develop understanding*.

Teachers' Affective Beliefs about Assessment

Item three sought to explore participants' affective beliefs related to assessment. Affective beliefs were categorised as either positive or negative. Twelve out of the 23 pre-service participants gave negative feelings about assessment, using terms such as fear, scary, struggle, or stress to describe their feelings related to assessment. These included responses such as: *overwhelming, scary and fear of failing* (Participant 18) and *feeling stressed because of workload* (Participant 15). Seven pre-service participants gave responses that represented a feeling in favour of assessments, such as *satisfying* (Participant 10) and *positive feelings* (Participants 21, 22 and 11). They did not elaborate further on these responses. Four of the pre-service participants did not list any feelings related to assessment though reasons for the reticence are unknown.

Among the in-service participants, 17 expressed negative emotions about the term, describing their feelings in such terms as nervous, afraid, worried, or challenged. Their short responses gave little indication whether their dislike of the term was linked to their role as full-time teachers 'handing it out' or as part-time university students at the receiving end of assessment. Thirteen of the in-service participants indicated feelings that were positive in nature, giving short responses such as: *I feel happy because I know my position as a teacher – how much learning has taken place* (Participant 2) and *I get feedback for learning* (Participant 25).

Teachers' Initial Understanding of Summative and Formative Assessment

Only five of the 23 pre-service participants were able to give a definition of summative assessment. The common answer they gave was 'testing' and 'examinations'. Eighteen of the pre-service participants did not provide any response to this item, a clear indication that pre-service teachers are generally unfamiliar with the term 'summative assessment' if not with the concept, because they did show some understanding of assessment in their previous responses. Likewise, only four of the pre-service participants gave a response regarding formative assessment. Their responses included formative assessment ideas such as 'group work', 'homework', and 'class activities'. For one of them, *formative assessment is done to see mistakes of students and improve teaching process* (Participant 17). Another participant noted that *formative assessment is testing prior knowledge at the beginning of the class* (Participant 19). A majority of the pre-service participants were not able to define formative assessment.

For the in-service participants, the majority were able to define summative assessment: 28 of them articulated a correct understanding of it. Their responses mainly included 'testing' or 'examinations' at the end of the teaching term. Some of them responded with purposes such as 'grading' and 'ranking' to show their understanding of summative assessment. In summary, a majority of the in-service participants could provide an understanding of summative assessment. As expected, they would have come across the term as a result of their teaching experiences. The same trend was noticeable in the analysis of their responses about formative assessment, where 26 of them gave evidence of some understanding about the term, using terms or phrases such as 'feedback', 'assessment for learning', 'remedial work', or 'prior knowledge' to describe their conceptualization of the term. Once again, the majority awareness of the term among this group teachers was perhaps a consequence of their classroom teaching experience.

Teachers' Preference for Summative or Formative Assessment

After the short presentation on summative and formative assessment, it could be assumed that those participants who initially had no understanding of the two concepts could now be in a position to understand and support one or other of the categories. Although this exercise presented the two components of assessment as dichotomous, this was done with an aim to explore participants' beliefs, rather than to imply that assessment is, in essence, of either one or the other type. Out of the 23 pre-service participants, 20 now supported the idea of formative assessment. For this group, formative assessment was now seen as better because it gave 'feedback' for teaching and learning. They saw that formative assessment could be used to improve teaching and learning. Out of the 20 who explicitly supported the idea, a majority went on to state clearly their dislike for summative assessment. The following participant's response exemplifies how this group now wrote in favour of formative assessment and held back from being supportive of summative assessment:

I would be in support of formative assessment as it uses face to face interaction or personal interaction to assess a student and it is likely to be more productive, engaging, fun and easier when done in the classroom setting. It will also give me a quick feedback on how students are doing with the delivery of my lessons. Summative assessments are stricter, boring, time consuming and students become less engaged and it also births competition between students. Formative assessment is the way to go. (Participant 18)

Out of the 20 pre-service teachers who supported formative assessment as their preferred form of assessment, three were nevertheless of the view that summative assessments are equally important. For example, one participant wrote:

Formative assessment ... it is because you can assess your students any time, ... can be during the class or after the class. It helps the teachers to know the performance of the individual students and get feedback on how each student is performing. They can change their teaching methods to suit the students. For summative assessment, it is fairly important since students are able to be finally graded and monitored; it plays an important part in deciding their future. (Participant 9)

Three pre-service participants gave a precise preference for summative assessments. However, they also wrote in support of formative assessment. For example, the following participant noted support for both types:

I think summative is more important because at the end of the day, students are assessed on their performance. Formative is also important because it helps modify children's learning. Well, I think both are important. (Participant 12)

These findings are in contrast to previous findings such as those of Dayal and Lingam (2015) and provide evidence that pre-service teachers do support formative assessment over summative assessment. Barnes et al (2015) highlight similar pre-service teacher support for formative assessment through their review of two further studies in 2011, (Thomas, Deaudelin, Desjardins, & Dezutter, 2011; and Davis & Neitzel, 2011). However, as noted in the present study, pre-service teachers are likely to define assessments using summative terminology such as testing, examination or grading if they are asked to respond to a direct question like *what is assessment?* On the other hand, pre-service teachers, when given a choice, are likely to evince support of formative assessment, or of both. This confirms that it is perfectly possible for pre-service teachers to hold multiple beliefs about assessment.

The 29 in-service participants' beliefs were recorded as similar to those of the pre-service participants. In other words, they wrote in favour of formative assessments, generally for reasons similar to the ones discussed already. Thirteen of the 29 showed a dislike for summative assessment, for reasons mainly related to the heavy workload associated with it, for example in preparing and marking examinations. Sixteen of them believed that summative assessments are also important. Only four of the in-service participants gave explicit support for summative assessments, believing that they are the best way to find out how students have progressed, and perceiving them also as useful in gauging their own performance. They also argued the motivational value of summative assessments in pushing students to work hard and take their studies seriously. While a majority of the participants in both groups support formative assessments, a small number in both groups see summative assessment as important, while giving some importance to formative assessments. Ashton (2015) argues that teacher belief systems are idiosyncratic and based on personal experiences, as well as evaluative and affective components. As such, beliefs are likely to reflect a significant amount of socio-cultural experiences which may flag an important tension between the negative and positive sides of summative assessment. Further study here would help clarify some of the cultural and other issues. As we have seen, the literature has often castigated the demotivational effect of summative assessment.

One of the notable findings of the current study has methodological implications for exploring teachers' beliefs in future studies. This is derived from the finding that the majority of pre-service participants would define assessment in a narrow and traditional manner using terminology such as tests and examinations, when asked to respond to questions such as *what is assessment?* This was confirmed by the participants' responses to item one. A previous study (Dayal & Lingam, 2015) also noted this. It could be concluded that using single items such as this one to elicit teachers' beliefs could provide only a limited insight into teachers' beliefs. A majority of the same set of pre-service teachers opted in favour of formative assessment over summative assessment. Some of them had shown negative emotions about assessment in their previous responses. This study was different in that it gave the participants an opportunity to go over the summative and formative terminology before writing in support of one of the two. Such a method of gaining an understanding of participant perspectives could be judged to provide a comprehensive and thorough understanding of one's beliefs in contrast to responses to simple open-ended items. However, there may be potential for bias, for example, if participants are unfairly exposed to researchers' personal beliefs about assessment. An important implication of this study is that researchers must use multiple methods to explore beliefs because clarifying the construct of teacher belief systems is a complex task. For example, as Wiliam (2007) points out, when teachers are asked how they assessed their students' learning, they give a more formal answer – tests, quizzes, or other rather formal methods. When tasked how they knew whether their students have learned or not (a slightly informal version of *how you assess*) teachers use more informal methods to describe their actions. This confirms the complexities of using the informal - formal or the summative-formative continuum as the only means of studying teacher beliefs about assessment. Using research methods such as interviews and observations to explore why teachers view assessment in the way they do could provide useful insights into factors which influence teacher beliefs about assessments.

Conclusion

The short study reported here utilised open-ended responses regarding two major purposes of assessment to explore pre-service and in-service teachers' beliefs about assessment. According to Barnes et al. (2015), the continuum of purposes of assessment, with pedagogical purposes on one end and accounting purposes on the other, has merits in terms of exploring teachers' beliefs about the purposes of assessment. The pedagogical purposes end and the accounting purposes end in this study were represented by the terms formative and summative assessments, respectively. Participants were asked to register their preference for one form of assessment or the other by providing reasons in support of one or the other form of assessment. This study found it useful to use such a classification to explore teachers' beliefs as well. The researchers are aware that greater care should be taken in not showcasing a false dichotomy of beliefs because teachers could see both forms of assessment as mutually supportive. Although the design presented two forms of assessment as apparently dichotomous, participants could, and did still, recognise the importance of both forms, thus confirming that teachers can hold both formative and summative beliefs about assessment. The framework Barnes et al. (2015) present contains different interest points along the pedagogical-accounting continuum. Exploring teachers' beliefs using their framework could be one area that future studies could usefully explore. The current study has limitations in terms using a summative-formative continuum in a broadly defined manner.

The findings of the current study confirm that pre-service and in-service teachers can hold beliefs that are in support of summative assessment, formative assessment, or both types of assessment. These findings are similar to the ones presented in a recent review of teacher beliefs about assessment (Barnes et al., 2015). The majority of participants in the pre-service and in-service groups gave explicit support in favour of formative assessment. Reasons given by both the groups were similar and were focused on the various pedagogical beliefs (Barnes et al., 2015) about assessment. Only a small number of participants gave a clear preference for summative assessments, for reasons related to student or teacher accountability. A small group of participants was comfortable with the view that both types of assessment are important. This proves that presenting purposes of assessment using a summative–formative continuum does not necessarily mean that the participants would perceive both types as mutually exclusive. None of the participants, however, noted that both forms of assessment are irrelevant, contrary to findings such as Brown (2004). This could be due to the relative importance given to assessment in the Pacific education setting. It could also mean that such beliefs may be implicitly held and would warrant further investigation. Findings from a previous study on the usefulness of assessment revealed that all the teachers agreed assessment was useful (Dayal & Lingam, 2015).

Apart from utilising novel methods of data collection, future studies could also investigate the relationship between teachers' beliefs about assessment and their classroom instructional practice. Often times, research in the area of teacher beliefs has rested on the appreciation that beliefs influence practices (Barnes et al., 2015). Findings in other related areas of teacher beliefs (e.g. Philipp, 2007; Raymond, 1997; Francis et al. 2015; Chen, Morris & Mansour, 2015) have proven that the relationship between beliefs and classroom practice is not straightforward. This seems to be an area worth exploring with respect to assessment related beliefs as well. Finally, obvious sample limitations have prevented the current study from providing an in-depth analysis of teacher beliefs from diverse cultures of the Pacific. Future studies targeting a more diverse and evenly representative range of Pacific pre-service and in-service teachers would be another area worth exploring.

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Hesitant to Seek Assistance in Certain Areas of University Life

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Abstract

The aim of this study is twofold: a) to investigate the area of least student involvement pertaining to a variety of university activities such as the use of the library, computer and information technology, writing experiences, experiences with the faculty, personal experiences, and student acquaintances, and b) investigate the differences in student involvement between faculties regarding these same university activities. Informed by the theory of student involvement, the study utilizes descriptive analysis for the level of involvement and the Kruskal-Wallis test to investigate faculty differences. This quantitative study, involving 332 students of the University of the South Pacific, identifies the relational and interactional hesitance in many measures. This included hesitance to seek assistance at the library or to seek advice from instructors on their writing. Furthermore, students are unlikely to work or socialize with a faculty member on a project or informally, and students are least likely to have serious discussions with others from a different country or political opinion. These findings have implications for positive student involvement and engagement, for student adjustment at university, and overall satisfaction with university.

Introduction

In order to increase the standing of a university and improve the quality of student experiences, it is important to invest and create optimal contentment in a variety of aspects to student life at university. Students' experiences of teaching, course outcomes, infrastructure and support services are important, and genuinely listening to students' voices and taking timely action on those matters are critical to fostering a positive environment. These, ultimately, assist in the social interaction and social adjustment essential to the persistence and academic success of students at university. This study therefore sought to gauge student experiences and involvement in various activities at The University of the South Pacific (USP). The aims of this study were to: a) investigate the area of least involvement of students on a variety of university activities such as the use of the library, computer and information technology, writing experiences, experiences with the faculty, personal experiences, and student acquaintances, and b) investigate the differences in student involvement between faculties regarding these same universities activities.

Theoretical Framework

This study is based on the theory of student involvement, which, 'refers to the amount of physical and psychological energy that the student devotes to the academic experience' (Astin, 1999, p. 518). An involved student, for example, puts sufficient time into studying, joins university clubs and organizations, interacts with staff and students, and uses its facilities maximally. The theory of involvement is premised on five basic tenets:

1. Involvement entails physical and psychological energy invested on objects;
2. Different students portray varying degrees of involvement on objects and may do so on different objects and at differing times;
3. Involvement can both be quantitative and qualitative;
4. The amount of student learning and personal development is associated with the quality and quantity of involvement in the university and program, and;
5. The effectiveness of any educational policy or practice is reliant on the capacity of that policy or practice to increase student involvement.

The theory of student involvement argues that to achieve the intended outcome in a curriculum, it is necessary to draw sufficient investment of energy and student effort. It purports active participation by students, which requires the teacher to focus more on what students do rather than on what they themselves do. It advocates that teachers elicit student involvement and constantly ask how they would get students to be involved (Astin, 1999). Educators are encouraged to focus more on how much time and energy they are spending on the learning process and focus less on the content and teaching techniques. Therefore, if a student has difficulties, it is important to investigate the other objects upon which they expended energy. Astin (1999) argues that students' academic difficulties often stem from competing involvements. The theory of student involvement recognizes that the involvement of individuals on university life contributes to their persistence, whereas, non-involvement contributes to students' departure from university (Milem & Berger, 1997). Dropping out is the ultimate form of non-involvement (Astin, 1999). The general notion is that students will get more out of university if they put more into it (Webber, Krylow, & Zhang, 2013).

Method

This study utilized the College Student Experiences Questionnaire (CSEQ), designed to assess where students spend their efforts and what they learn as a consequence of their college and university experience (Lundberg, 2003). Measured in the CSEQ are: writing experiences, campus facility use, course learning, the arts, experience with faculty, personal experiences, library use, computer and information technology, clubs and organizations, student acquaintances, science and quantitative experiences, topics of conversation, information in conversations, and gains in disciplines (Lundberg, 2003). Additionally, the first 18 items ask for the student's background information (Hu & Kuh, 2003). The CSEQ measures in-class as well as out-of-class experiences of higher education students (ibid). This questionnaire is purported by Hu, Kuh, and Li (2008) to have superb psychometric properties and moderate potential to assess student behaviour associated with university outcomes. It had been used since 1979 with over 350,000 higher education students and demonstrated reliability and validity since its inception (Lundberg & Schreiner, 2004). For these reasons, higher education institutions and researchers continue to see the utility of this instrument to measure student experiences at universities (Rocconi, 2011). Authors administered the questionnaires with university students in randomly picked classrooms but with permission taken from lecturers who were responsible for the classes. Ethical clearance was also received from the University to conduct the study. Students who participated gave consent on an information page at the beginning of the questionnaire.

Data Analysis and Results

The questionnaire items fell under the following topics: library; computer and information technology; course learning; writing experiences; experiences with faculty; art, music and theatre; campus facilities; clubs and organizations; personal experiences, and; student acquaintances. Each item was answered on a Likert scale with options of ‘very often,’ ‘often,’ ‘occasionally’ or ‘never,’ with 1 for ‘very often’ and 4 for ‘never’.

Descriptive statistics

Table 1: Mean and standard deviation: library functions least experienced by university students

	Mean	Standard Deviation
Used the library as a quiet place to read or study materials you brought with you.	2.07	.880
Found something interesting while browsing in the library.	2.69	.895
Asked a librarian or staff member for help in finding information on some topic.	2.93	.856
Read assigned materials other than textbooks in the library (reserve readings, etc.).	2.68	.971
Used an index or database (computer, card catalog, etc.) to find material on some topic.	2.20	.910
Developed a bibliography or reference list for a semester paper or other report.	2.48	1.015
Gone back to read a basic reference or document that other authors referred to.	2.86	.927
Made a judgment about the quality of information obtained from the library, World Wide Web, or other sources.	2.57	.988

Table 1 indicates that students were least likely to ask a librarian or staff member for help in finding information ($M = 2.93$, $SD = .856$) or go back to read a basic reference or document that other authors referred to ($M = 2.86$, $SD = .927$).

Table 2: Mean and standard deviation: computer and information technology functions least experienced by university students.

	Mean	Standard Deviation
Used a computer or word processor to prepare reports or papers.	1.50	.775
Used email to communicate with an instructor or other students.	1.57	.768
Used online platform to learn material for a course or developmental/remedial program.	1.28	.615
Participated in class discussions using an electronic	2.24	.927

medium (email, list-serve, chat group, etc.).		
Searched the World Wide Web or internet for information related to a course.	1.47	.718
Used a computer to retrieve materials from a library.	1.83	.874
Used a computer to produce visual displays of information (charts, graphs, spreadsheets, etc.).	1.73	.869
Used a computer to analyze data (statistics, forecasting, etc.).	1.89	.988
Developed a Web page or multimedia presentation.	2.74	1.050

Table 2 indicates that students were least likely to use computer and information technology to develop a web page or multimedia presentation ($M = 2.74$, $SD = 1.050$) or participate in a class discussion using an electronic medium such as email, list-serve or chat group ($M = 2.24$, $SD = .927$).

Table 3: Mean and standard deviation: writing experiences least experienced by university students.	Mean	Standard Deviation
Used a dictionary or thesaurus to look up the proper meaning of words.	1.92	.860
Thought about grammar, sentence structure, word choice, and sequence of ideas or points as you were writing.	1.68	.729
Asked other people to read something you wrote to see if it was clear to them.	2.28	.938
Referred to a book or manual about writing style, grammar, etc.	2.25	.921
Revised a paper or composition two or more times before you were satisfied with it.	2.04	.850
Asked an instructor or staff member for advice and help to improve your writing.	2.62	.987
Prepared a major written report for a class (20 pages or more).	3.11	1.037

Table 3 shows that students were least involved in preparing a major written report for a class of 20 pages or more ($M = 3.11$, $SD = 1.037$) or to ask an instructor or staff member for advice and help to improve their writing ($M = 2.62$, $SD = .987$).

Table 4: Mean and standard deviation: faculty member interactions least experienced by university students.	Mean	Standard Deviation
Asked your instructor for information related to a course you were taking (grades, make-up work, assignments, etc.).	2.27	1.061
Discussed your academic program or course selection	2.72	.961

with a faculty member.		
Discussed ideas for a semester paper or other class project with a faculty member.	2.80	.961
Discussed your career plans and ambitions with a faculty member.	3.13	.953
Worked harder as a result of feedback from an instructor.	2.31	.915
Socialized with a faculty member outside of class (had a snack or soft drink, etc.).	3.28	.967
Participated with other students in a discussion with one or more faculty members outside of class.	2.82	1.014
Asked your instructor for comments and criticisms about your academic performance.	3.05	.979
Worked harder than you thought you could to meet an instructor's expectations and standards.	2.45	.920
Worked with a faculty member on a research project.	3.41	.890

Table 4 shows that students were least likely to work with a faculty member on a research project ($M = 3.41$, $SD = .890$) or to socialize with a faculty member outside of class such as having a snack or soft drink ($M = 3.28$, $SD = .967$).

Table 5: Mean and standard deviation: personal interactions least experienced by university students.	Mean	Standard Deviation
Told a friend or family member why you reacted to another person the way you did.	2.30	.973
Discussed with another student, friend, or family member why some people get along smoothly and others do not.	2.26	.930
Asked a friend for help with a personal problem.	2.35	.988
Read articles or books about personal growth, self-improvement, or social development.	2.58	.950
Identified with a character in a book, movie, or television show and wondered what you might have done under similar circumstances.	2.34	.984
Taken a test to measure your abilities, interests, or attitudes.	2.71	.952
Asked a friend to tell you what he or she really thought about you.	2.63	1.052
Talked with a faculty member, counselor or other staff member about personal concerns.	3.51	.843

Table 5 shows that students were least likely to talk with a faculty member, counselor or other staff member about personal concerns ($M = 3.51$, $SD = .843$).

Table 6: Mean and standard deviation: least experienced student acquaintance interactions.	Mean	Standard Deviation
Became acquainted with students whose interests were different from yours.	2.51	.918
Became acquainted with students whose family background (economic, social) was different from yours.	2.35	.872
Became acquainted with students whose age was different from yours.	2.47	.877
Became acquainted with students whose race or ethnic background was different from yours.	2.37	.907
Became acquainted with students from another country.	2.49	.925
Had serious discussions with students whose political philosophy of life or personal values were very different from yours.	2.96	.945
Had serious discussions with students whose political opinions were very different from yours.	3.01	.939
Had serious discussions with students whose religious beliefs were very different from yours.	2.91	.965
Had serious discussions with students whose race or ethnic background was different from yours.	2.95	.938
Had serious discussions with students from a country different from yours.	3.02	.979

Table 6 shows that students were least likely to have serious discussions with students from a country different from theirs ($M = 3.02$, $SD = .979$) or to have serious discussions with students whose political opinions were very different from theirs ($M = 3.01$, $SD = .939$).

Kruskal-Wallis Test

A Kruskal-Wallis test was conducted, as assumption of normality was not satisfied, with Faculty as the independent variable and library, computer and information technology, writing experiences, experiences with faculty, personal experiences, and student acquaintances, as the dependent variables. In library usage, the three faculties differ in finding something interesting while browsing the library, χ^2 (d.f. = 2) = 20.731. FB, $Mdn = 3$ and FS, $Mdn = 3$, displayed higher median score than did FA, $Mdn = 2$, $p < .0005$. The three faculties also differ in students reading assigned materials other than textbooks in the library such as reserved readings, χ^2 (d.f. = 2) = 22.277. FB, $Mdn = 3$, and FS, $Mdn = 3$, displayed a higher median score than FA, $Mdn = 2$, $p < .0005$.

The third area in which the three faculties differed was on having gone back to the library to read a basic reference or document that other authors referred to, χ^2 (d.f. = 2) = 19.572. FB, $Mdn = 3$ and FS, $Mdn = 3$, showed higher median scores than did FA, $Mdn = 2.50$, $p < .0005$.

In terms of computer and information technology use, the three faculties differed only on the use of computer to analyze data such as in statistics and forecasting, χ^2 (d.f. = 2) = 15.876. FB, $Mdn = 2$, and FA, $Mdn = 2$, showed higher median scores than did FS, $Mdn = 1$, $p < .0005$. There were no significant

differences between faculties found on writing experiences, personal experiences, and student acquaintances.

Discussion

A major finding of this study is interactional and relational hesitancy on six measures. These were the hesitance to: seek assistance at the library, seek advice from instructors on their writing, work or socialize with a faculty member on a project or informally, and have serious discussions with others from a different country or political opinion.

In terms of the library, orientations are provided at the beginning of semesters and there is a help desk. However, students are not seeking assistance, either because they are competent library users or are hesitant to do so. It is important to employ proactive outreach to students in library skills to reduce library anxiety, enhance information-seeking behavior, and ultimately student success. The library is a major tool for promoting student success and it should not be overlooked by administrators (Roselle, 2008). Students in this study use the library mostly as a quiet place to read or study materials they brought with them. They also feel they have general competence in using an index or database.

In terms of students' personal experiences, students are least likely to talk with a faculty member, counselor or other staff member about personal concerns. In addition, with their experiences with the faculty, this study found that students are least likely to work with a faculty member on a research project. They also were least likely to socialize with a faculty member outside of class such as having a snack or soft drink. Cox, McIntosh, Terenzini, Reason, and Quaye (2010) studied 2,845 faculty members from 45 campuses at US universities, and found that faculty members appear to have little contact with students outside of the classroom. There is educational value in substantive interaction with students in non-classroom situations, and this is an area requiring much more improvement by many universities. A number of non-classroom activities are organized such as orientations, poetry performances, open day, the learning support centres, debates and others, where staff-student interaction could occur outside of classroom contexts. However, more could be done by the University to allow staff-student interaction out-of-class. As an example, the lead author attended a university-organized student debate, and besides the organizers, there were only two other faculty members, with most of the audience being students. Thus, the avenues for non-classroom student-staff interaction may exist, but staff members are not attending them. Often, if staff members attend, they may not necessarily interact with students. Cox and Orehovec (2007) found this when they observed events at a residential university where the majority of faculty members and students were not engaged with each other outside of the classroom, even though there were conduits for it to happen. Cox and Orehovec further noted that the contacts they saw outside of the classroom were more trivial, incidental and unintentional, such as polite greetings and waves. They suggested that faculty-student functional and purposeful interaction could be bolstered in many campuses through articulation of policies and novel initiatives to foster faculty-student interaction.

Bolstering faculty-student interaction carries benefits and Strayhorn (2010) concluded in the study of 215 undergraduates that students' interaction with the faculty is important as it positively affects achievement, adjustment to university, sense of belonging and satisfaction with the university. Therefore, it is important to explore ways to structure and redesign university curriculum to provide opportunities for students to interact with the faculty both inside and outside of the classroom

(Strayhorn, 2010). Strayhorn (2010) further emphasized that many students drop out of university because of unsupportive, unfriendly and unproductive relationships with the faculty. Dorovolomo and Maebuta (2014), in their study of Solomon Islands students found that there were a variety of issues these students had with faculty members, including cases of poorly run tutorials, favouritism, poor assignment feedback, or difficult-to-comprehend accents.

Faculty approachability has also been raised as a major point of concern through this study. Noteworthy is the finding that students are least likely to seek assistance in other areas or least likely to work with a faculty in certain non-classroom activities. Regarding their writing experiences, this study found that students were least involved in preparing a major written report for a class of 20 pages or more and were least likely to ask an instructor or staff member for advice and help to improve their writing. Sander, Stevenson, King, and Coates (2000) studied 395 undergraduates of three British universities and found that the two top ratings for a good teacher were advanced teaching skills, followed by approachability. Denzine and Pulos (2000) studied characteristics that make a faculty member approachable and found that faculty member approachability tended to relate to specific behaviours reflecting concern for students. These manifest themselves in simple but important gestures such as staying after class to meet students, knowing the name of students, or willingness to meet them at one's office (Denzine & Pulos, 2000). The caveat, according to Reid and Johnston (1999), when comparing staff and students' perceptions of good teaching, found that lecturers demonstrated a lack of awareness of students' perception of the importance of their approachability as part of good teaching. Faculty members often think they are approachable when in fact they are not (ibid).

This study also found that students were least likely to have serious discussions with students from a country different from theirs or to have serious discussions with students whose political opinions were very different from theirs. Hu and Kuh (2003) identified three levels in which students experience diversity. One is structural diversity, which refers to the demographic composition of the student population. The second is classroom diversity, which refers to the degree to which the concept of diversity is included in the curriculum. The third is interactional diversity, or the extent to which students of different backgrounds get in contact and interact in educationally purposeful ways (Hu & Kuh, 2003). They stressed, however, that most educational institutions focus more on structural and classroom diversity, rather than interactional diversity (ibid). Having a diversity of recruitment and cultural content can have important personal development outcomes for students, but the impact of meaningful interaction between students from different races, ethnicity, socio-economic backgrounds, countries of origin, political and religious standpoints need mechanisms of facilitation (ibid). In other words, there need to be strategies at universities that deliberately enable students to interact with others of diverse backgrounds so that it does not exist merely structurally and within the curriculum, but also in the lived experiences of students.

Hu and Kuh (2003), in their study of 53,756 undergraduate students, found that positive interpersonal environments are more likely to occur where the features of the learning milieu induce personal and ongoing contact rather than intermittent contact opportunities. The University of the South Pacific attracts students of different cultures, race, ethnicities, languages and customs from across the Pacific Islands. When international students from other nationalities are included, there is significant diversity, which requires intentional efforts to promote interactions between students of diverse backgrounds, instead of sticking to their own groupings. Lundberg (2007), in a study of 643 university students, found that student involvement and institutional commitment to diversity promotes student learning,

especially for those of minority groups. This indicates the need for student affairs to boost institutional emphasis on diversity. It is not merely student engagement, but the rigor of the institution's emphasis upon the value it places on diversity which is important, because this shifts the responsibility for student success more directly to the institution. This has implications for hiring decisions, programs and events, policies and practices to the equitable appointment of students and staff to positions and committees (ibid).

A finding of this study, which is not relational and interactional in nature, is that students are least likely to use computer and information technology to develop a web page or multimedia presentation or participate in a class discussion using an electronic medium such as email, list-serve or chat group. Moreover, the Faculty of Business (FB) and Faculty of Arts (FA) students are least likely to use a computer to analyze data such as statistics and forecasting than are Faculty of Science (FS) students. Students at the University generally had good ratings for computer skills. Web page development may not necessarily be a requirement for students unless they study computer science. Of note is the fact that students from the FS have significant strength in the use of computers to analyze data and forecasting, compared to those from other faculties in that they specifically teach quantitative skills to their students. This may also depict the quantitative analysis skills of FS staff members. Some of the leadership of the University recommend that staff of the FA should conduct more quantitative studies and analysis of large samples, seeing that the faculty is more qualitative-oriented. The only other difference between the faculties was that students from the FS and FB are least likely than the FA to find something interesting while browsing in the library, read assigned materials other than textbooks in the library such as reserve reading or go back to read a basic reference that other authors referred to. Bridges (2008) reported similar findings when studying library use by disciplines, and found that students from the agricultural sciences and engineering use the library less than those from liberal arts. Another factor at the USP could be that the FS and FB may often assign prescribed textbooks and the FA may do less where their students are required to use the library services more.

In terms of computer competencies, Kuh and Vesper (2001) found in their study of more than 125,000 undergraduates, that increased familiarity with the computer contributes to the development of other skills and competencies necessary for success at university. Thus, it is encouraged that students are proficient with computer use, including other forms of information technology as soon as possible to maximize the benefits of university (ibid). For this reason, it was important that the University introduce a generic course on communications and information literacy aimed at developing incoming students' knowledge and skills in the use of computers and information resources. As does this study, Hunt (2003) identified practical applications to Astin's (1999) theory of student involvement in his practice at university. Hunt recognized the importance of building supportive student-faculty relationships as a critical variable for student persistence. A conducive student-faculty environment can be achieved through availability of lecturers in and out of the classroom, comfortable open discussions, debates on points of view, and asking questions. Often neglected, Hunt (2003) went further to explain that learning students' names in your class and knowing each of them as individuals are crucial steps to building rapport within the faculty. Moreover, it is important to refrain from using intimidation and belittlement but to show enthusiasm (Hunt, 2003).

The theory of student involvement suggests that the most precious institutional resource may be student time, recognizing that educators will have to compete with other forces in the student's life for time and energy (Astin, 1999). Astin (1999) furthermore explains the zero-sum game where the time

students spend with family, friends, job, and other activities represents a reduction in the time they would otherwise have available to spend on educational development. Thus, it is important for the University and faculty members to note that every institutional policy and practice should go towards affecting the way students spend their time and energy on academic pursuits.

Conclusion

Early involvement among students and with the faculty is of great significance. Universities need to encourage students to be involved with their peers more, as well as emphasise the need for students to be actively engaged with faculty members. Practitioners often think that the engagement of students with faculty members should be something that happens later in the students' university studies, but the earlier the better it is to elicit maximal student involvement in facets of the university. The high hesitancy to seek assistance whether at the library, from a faculty member, or at the counseling office are areas of staff approachability that would benefit from being addressed. Faculty-student interaction and weak inter-country involvement in certain areas in and out of the classroom also need attention. Thus, a diverse university population needs to be managed in a very different way than before in higher education in order to enhance student experiences.

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Assessing the Potential Role of Education as a Tool for Adaptation to Climate Change in two Rural Communities in Solomon Islands.

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Abstract

More than 85% of the Solomon Islands' population lives in villages and communities within 1.5 km from the coast. Therefore, these communities are exposed to extreme ocean-based events, whose intensity and variation are expected to increase due to climate change. The government realizes the expected devastating impacts on the population, and has partnered with aid-donors to invest millions of dollars in climate change related programs, especially mitigation, adaptation and transformation strategies in rural communities. This paper describes people's perceptions of the role of education as an adaptation and transformation tool to cope with negative impacts from climate change. We describe the situation of two study sites in rural communities in Solomon Islands. One study site covered Oibola Village, Langa Langa Lagoon, Malaita Province in 2013. The second study site covered communities of Keigold and Mondo, Ranogha Islands, Western province in 2015. In both locations, we identified that communities were applying a climate change focused education that can be considered a useful model for adaptation to climate change to be replicated in other rural communities in Solomon Islands. In both study sites, we found converging insights with regard to participants' strong beliefs that formal education provided a long-term adaptive mechanism to climate change and extreme environmental events.

Keywords: Adaptation, Climate Change, Communities, Formal Education, Extreme Environmental Events

Introduction

The Solomon Islands is located in the Southwest Pacific about 1,900 km northeast of Australia with about 996 islands stretching in a 1,450-kilometer chain southeast from Papua New Guinea (Coleman & Kroenke, 1981). It has a population of around 537,000 inhabitants who share a total land area of approximately 27,500 sq km. The majority (85%) of the population live in rural areas (Gagahe, 2011). Rural communities in Solomon Islands have been shown to anticipate tangible rehabilitation and reconstruction programs in their villages, implemented by the government and development partners, to adapt to the increasing impacts of climate change (Solomon Islands Government Household Survey, 2015). The expectation is particularly great amongst villagers who have been previously affected by natural catastrophes, extreme weather events such as earthquakes, tsunamis, cyclones and tropical storms, landslides, coastal erosion, and coastal inundation. Since the majority of communities live within

1.5 km of the coast, villagers will continue to experience threats from extreme environmental events (hereafter, EEEs). Different strategies are usually recommended to communities for building resilience to such exposures. Villagers are usually open to receiving assistance from government, development agencies and NGOs, whose programs may include the participation in relocation programs, adoption of new technologies or the investment in building adaptive capacities. Given the 'come and go' nature of such programs, all those long-lasting effects initiatives will be more effective. It is argued that one approach to a longer-lasting effect is to include an education component. Eakin (2005) identifies adaptive capacity (to climate change) as those characteristics of an individual, household or population at a specific location that allows them to manage climatic risk, including extreme environmental events; these being functions of wealth and education.

Managing risks from extreme events and disasters, including weather events, as part of climate change adaptation, is a challenge for small island developing countries. The Intergovernmental Panel on Climate Change (IPCC) has put special attention on outlining variables that communities could improve to combat the impact of extreme events (IPCC, 2012). The report also elaborates on mitigation options and demonstrates how innovation and change have expanded the availability and effectiveness of adaptation. For example, new technologies and infrastructure development can increase the resilience of human systems while reducing adverse impacts on natural systems. Investments in technology and infrastructure rely on an enabling policy environment, access to finance and technology, and broader economic development that builds capacity.

Knowledge and education are recognized as key components of disaster risk management (Shaw et al. 2010; UNICEF 2011), and thus play a key role in adaptation capacity when making decisions at a community level. Adaptation cannot be attained if there are no financial resources, technology transfer, cultural or social support, nor in the absence of educational, managerial or institutional frameworks to transmit the process (Pelling, 2011). The IPCC (2012) states that better education and training are required. However, as Pelling (2011) highlights, villages or communities need to move from resilience to transformation if they are to effectively adapt to increasingly adverse impacts from climate change. The report states that education is a critical factor for the shift from resilience to transformation. This is also the case in other parts of the world, beyond small island developing countries. For example, Paavola (2008) determines that education is important for building long-term adaptation to impacts of climate change and extreme events in a study in Morogoro, Tanzania. Paavola (2008) states that public spending and programs on health, education and wellbeing are needed in order to build adaptive capacity for communities. Similarly, Eakin (2005) illustrates that institutional change, climate risk, and rural vulnerability were important concepts when trying to introduce any effective adaptation measure at the local level, and demonstrates the importance of wealth and education in a case study in Central Mexico.

There is often enthusiasm expressed about the potential economic benefits provided through education, which could fund adaptive capacity measures by communities (Behrman & Stacey 1997; Cost 2015). However, this increased adaptive capacity covers a wider set of values than purely wealth creation, increasing the options to individuals and families, wealth creation being only one facet of the needed transformation. Community members must also realize the importance of education towards increasing their adaptive capacity at the rural village level. To achieve a meaningful transformation, ethical concern for social and environmental justice should drive the paradigm of changing from resilience to transformation (Pelling, 2011). Therefore, education, including the above social and

environmental components, has to be driven by the community. Thus, values associated with cultural traditions that promote community well-being, and those spiritual values that consider the local environment, in terms other than as a mere resource, are of special concern (Morrison 2008; Morrison & Singh, 2009; Morrison 2012; Morrison, 2016). These values emphasize that adaptive capacity is part of a process within a learning system intrinsic to human ecology.

Education can be broadly classified as formal and informal. Formal education is that which is promoted and delivered by the government within schools, while informal education is that which is provided traditionally, within community and home settings. While traditional education includes the typical traditional values that go beyond pure wealth creation, formal education about climate change can add to these traditional values and knowledge about adaptation at the community level, thereby improving the local adaptive capacity (Morrison & Singh 2009 Morrison, 2016).

Formal education is therefore not only important for adaptive capacity due to the potential economic benefits it can bring, but also due to its role in explicitly teaching about climate change adaptation. It is helpful for climate change adaptation to be promoted in schools, beginning at the primary and secondary school levels, and mainstreamed into the entire education system (Pielke, Prins, Rayner, & Sarewitz, 2007). However, resources for education pertaining to climate change and simple rules to guide adaptation decisions have been limited (Fankhauser, Smith, & Tol, 1999). A better understanding of the potential transformative role of formal education could help address these limitations.

Research Positions and Objectives

This study starts with three main positions in mind: Firstly, that formal education is part of a transformation process involved in adaptation to the impacts of climate change and extreme weather events. In such a context, adaptation to these events cannot be understood merely as making an existing set of a community's social-ecological processes more resilient.

Secondly, we state that one facet of the transformation involved in climate change adaptation is the increasing option for wealth creation provided to individuals and families through formal education. Formal education has the potential to assist young people to earn qualifications that enable them to find employment and hence improve their family's economic response capacity to climate change and EEEs.

Thirdly, we propose a second facet of the transformation, that formal education can support climate change adaptation through the expansion of existing informal cultural learning systems about community well-being and the local ecosystem. New technologies to extract resources, for example in fishing, require new guidelines for environmental management and social organization.

The main objectives of this study were to twofold: to discover whether or not the potential role of education was recognized and adopted by villagers of two rural communities in Solomon Islands that have suffered EEEs, and to discover whether or not they perceived any benefit from education in adapting to climate change. We sought to understand this by identifying and comparing the perceptions of villagers concerning education as a tool for adapting to climate change and extreme environmental events.

Study Sites

The study covers two sites and three communities, all of which are impacted by climate change and EEEs. The first community, Oibola village of Langa Langa Lagoon in the Central Malaita Province, is dominated by villagers who have traditionally depended heavily on marine resources and fishing for livelihood during the past century and are commonly known as the ‘saltwater people’. The second site is in Mondo and Keigold villages, in the Western Province of the Solomon Islands.

These two sites were chosen since they are impacted by climate change, especially through sea-level rise. They are both also involved in conservation and rehabilitation of their resources as part of a resilience program for adaptation to the impacts of climate change. For example, the Oibola community was supported by WorldFish⁵ – a Non-Government Organisation (NGO) conducting mangrove rehabilitation programs (Albert & Schwarz 2013; van der Ploeg *et al.* 2016) by way of the SWoCK⁶ project on backyard farming supported by UNDP⁷.

Study Site 1- Oibola Village



Prepared by Reginald Rueben, GIS Officer, MECDM

Figure 1: Map of Oibola Village, Malaita Province

In comparison to Keigold and Mondo, the Oibola community residents face the impacts of climate change through immense pressure on their food security. Oibola community residents simply do not have adequate land available for family farming and other agribusiness, and therefore gather much of

⁵ WorldFish is an NGO whose mission is to reduce poverty and hunger by improving fisheries and aquaculture over the world.

⁶ SWoCK- Strongem Waka lo Community Kaikai: Resilience in Agriculture and Food security in the Solomon Islands

⁷ UNDP - United Nation Development Program, country office in Honiara, Solomon Islands

their food from the ocean. This has forced the community residents to depend highly on cash-flow to support their families. The high degree of dependency on marine resources has become unavoidable, and the introduction of adaptation programs are a necessity. Relocation or re-settlement is, however, not an immediate option because of land ownership issues. Beside this, the Langa Langa Lagoon people traditionally were not farmers but fishermen and fisherwomen. According to our research findings, both men and women at this site spent more than 95% of their time on non-farming ventures to sustain their livelihood. They have been depending on fishing and marine resources for the last hundred years.

Study Site 2: Mondo and Keigold Villages

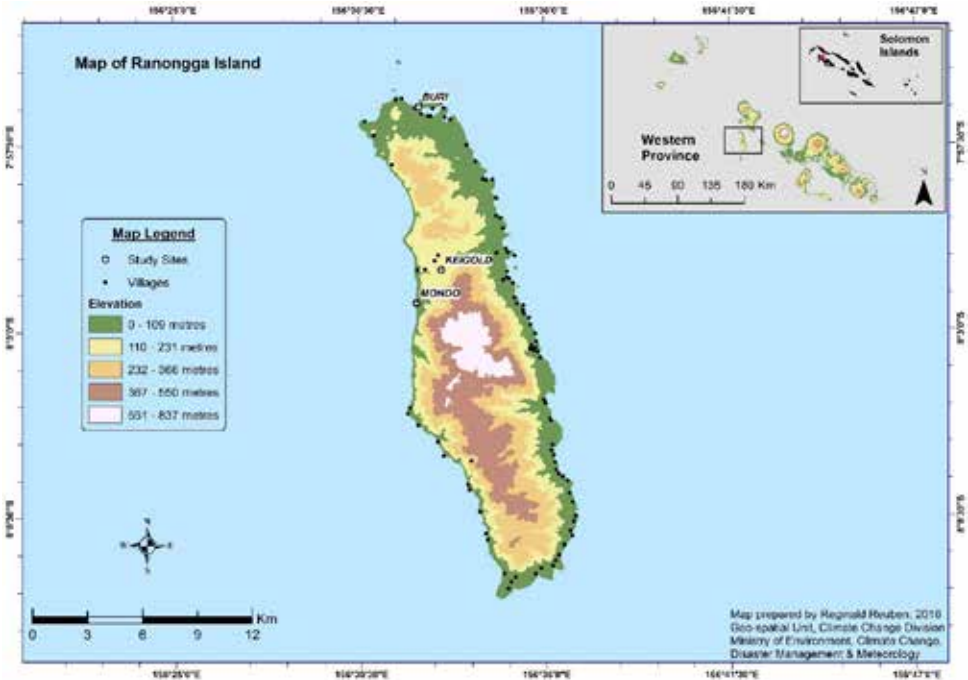


Figure 2: Map of Ranogha Island of Western Province

The objective for the creation of Keigold village was to resettle the people who moved from Mondo after a tsunami destroyed or damaged their houses in 2007. The new location is 145 meters above the sea level. The population of Keigold was 480 people in 2015, spread across 82 households. New homes were built after the disaster, and residents were able to make new gardens, plant new crops and begin rebuilding their lives. However, approximately 10% of the population decided to remain at the old Mondo village. These villagers cited cultural and religious beliefs and land ownership as some of the reasons given for not relocating to Keigold village.

Material & Method

We used primary and secondary data as part of a research project that assesses ways to achieve long-term resilience to climate change and EEE impacts in Oibola village, Malaita Province, and Keigold and Mondo villages located on Ranogha Island in the Western Province, the Solomon Islands.

The fieldwork at Oibola village was conducted between 2nd May and 8th June 2013, and villages of Keigold and Mondo between 15th September and 9th October 2015. We used primarily qualitative information obtained from semi-structured interviews with selective community leaders and youths. The interviews covered a series of questions focusing on the respondents' perceptions with regards to the role of education to assist them in adapting to climate change and EEEs.

Qualitative Methodology

The research team employed qualitative methodology to guide the data collection and analysis. This was chosen for its increased ability to understand complex situations with textual descriptions of how people experience an issue or context (Silverman 2006). Multifaceted situations can often be better explained qualitatively, rather than by relying solely on measurement through a quantitative approach. For example, it provides information about the 'human side' of an issue, such as: contradictions in behaviours, beliefs, emotions, opinions, perceptions and relationships of individuals to groups. Qualitative research methods are also effective in identifying intangible factors, such as societal or social norms, socioeconomic status, and gender roles in a community, ethnicity, and religion, to explore potential influences in a situation that may not be otherwise readily apparent.

Interview Questionnaires

The research team used semi-structured questionnaires to conduct interviews. This type of questionnaire was employed because they tend to be conversational and informal in tone (Longhurst 2003; Horton, Macve, & Struyven, 2004). This approach was taken for this study because it allowed interaction with the respondents' feedback regarding their perception on the importance of education for transformation and adaptation to climate change. This method was employed in the hopes of developing openness and soliciting honest answers in discussing both the questions and responses.

A total of 90 respondents were interviewed during the visits, with one member randomly chosen from each selected household to be interviewed. There were 87 households from Oibola village from whom the team interviewed 40 respondents, representing 46% of the village. In the villages of Keigold and Mondo there were 82 households, and we interviewed 50 participants, accounting for 61% of the study site. Through this approach, we surpassed Kotlik and Higgins's (2001), recommendation of covering 30% of households in order to fairly represent a given population.

Before starting the interviews, the purpose of the study was explained, namely to discover the nature of EEEs at the site, the participants' perception on the relation between these extreme events and climatic change and, how people at the village, including the respondents themselves, had responded to such events. The role of education in adaptation was later inferred from these questions as a component of a broad scope research project. During later research at Keigold and Mondo villages, the principal researcher shared the story told by the Oibola village participants of how they perceived and claimed that education could solve their situation through providing a long-term adaptation mechanism for most lagoon coastal communities. Sharing the stories told by the Oibola community was a prompt to

introduce reflections on the role of education for the second study site. The intention was not to strictly compare the two sites, but rather to explore the concept as deeply as possible. It was therefore pragmatic to encourage the second site respondents to build on what was learnt from the first site.

At both sites, the principal researcher and research assistant grouped the respondents according to age and gender, that is, adult, youth, elders (mostly men), women, government employees and, church leaders. The principal researcher then acted as moderator when asking the respondents about their perception of education and adaptation, ensuring clarity and coherence in the response to the question. Each group comprised 4 to 6 people, to allow the respondents to talk freely about their perceptions.

The study method aimed to discover participants' perceptions on the relocation process. For the second site, these engagements were critical to ascertain the level of support the community had for their recent relocation from Mondo community to Keigold. It was also desirable to understand which influence education played in that relocation process, from decision making to implementation, and push and pull factors in the community's long-term adaptation process. For example, respondents were allowed to provide open-ended expression of the reasons they thought relocation of their primary school to the new location was a strategic measure towards pursuing education as an adaptation modality.

The researcher anticipated spending an average of one hour per group interview, but realized the interviews needed to be longer or shorter in most cases. Communication difficulties were also anticipated, particularly with the elderly groups, due to the likelihood that the demographic only speaks their local language. To counter this problem, the research team engaged two research assistants from each project site, whom were responsible for explaining the themes and questions to the elderly villagers at these sites. All the interviews were conducted in Pidgin (the lingua franca of the Solomon Islands), however, it was necessary, in some interviews and focus groups, to translate into their local language and then translate back to Pidgin, and then to English during the recording process. Interviews were recorded by writing down their responses to each question.

Grounded Analysis of Data

Following the qualitative approach, the interview data was analyzed to obtain preliminary findings about the viability of the three research positions (Strauss, 1987). Interview and focus group recordings were transcribed and then thematized along the lines of key concepts contained in the research positions for each of the two sites studied. Ethnographic details that exemplified the main themes were highlighted. Comparison of the two sites was made by interpreting the relative similarity of the thematized data from the two sites.

Findings

The findings of the study are presented under two thematic areas within education as a tool of adaptation. The first theme is the indirect benefit of education for enhancing adaptive capacity by providing economic benefits. The second theme covers the perceived importance of explicit education about adaptation to climate change, including the need for better use of the environment. Table 1 shows the level of education of respondents from two sites.

Table 1: Level of Education of Interviewees at Study Sites

Gender	Keigold & Mondo	Oibola
Male	60%	63%
Female	40%	37%
Educational Level		
No formal education	0%	0%
Primary School	52%	23%
High School without graduation	23%	20%
High School -complete	17%	54%
Tertiary	8%	3%
Total	100%	100%

The Indirect Benefit of Education for Adaptive Capacity

The findings revealed that, amidst the increasing adverse impact of EEE and climate change, there is a need to adopt education, by individuals and household units, as a means towards adaptation. This is because education helps the communities to make informed decision over their resources. Chief Herrick of Keigold village informed the research team that education is important for adaptation at the village level. Most villagers realize its significance as one of the mechanisms for long-term adaptation at the local level, and consequently send their children through primary and secondary schools at these villages. Chief Herrick reported that more than 95% of the children in the community have now attended primary school. Although this is slighter lower than the 99% of enrolment in primary school nationwide (UNICEF, 2011), it is seen to be a huge improvement over the norm in other rural communities. Moreover, about 95% of these primary school children progressed to secondary schools. On aggregate, this is higher than the record of 38% to Junior high school and 28% to Senior high school, nationwide. Overall, there was a positive perception about the role of education as a vital tool for increasing the communities' household units' capacity for adaptation.

The head teacher of Keigold Primary School, Mr. Rickson, confirmed that, even though they only have a local primary school, every year more than 15 students complete secondary school in other parts of the province or Honiara, the capital. At the time of the research, about 20% of households in the village had their children attending either secondary or tertiary schools in various parts of the country. More than 60% of respondents at Keigold and Mondo have expressed and have seen this as their opportunity to raise the economic status of their families, due to the expectations of better future employment opportunities for their children. Hon. Chief Herrick expressed the common hope in his own words: 'I am

optimistic that my elder daughter is successful in her high school examination and continues to do her first year degree in education at the Solomon Islands National University (SINU)'. A similar sentiment was also expressed by his cousin, Mr. Lonsdale. 'I'm positive that my girl will do well in her Form 5 exams at Buri Community High school (the closest high school on the island) and continue her tertiary education in Honiara.' These respondents were characteristic of more than 65% of the interviewed parents, who hoped that their children were succeeding in their exams to commence their higher formal education.

Chief Benjamin Wale of Oibola village also shared similar sentiments about education and adaptation at his community. During the previous visit to Oibola village, he communicated to the research team that education is an important tool in assisting the community to adapt to the increasing impacts of climate change. He gave an example of his own family. He has four children: three are in the primary school and one at the secondary school level. His daughter at the time of the research was doing her first year at the King George National Secondary School. In his reflection to the team, he mentioned that he had not completed his formal education and was therefore unable to adequately assist his family financially to adapt to the increasing food insecurity brought by climate change. He informed the team that, as the chairperson of the community, he is well aware of his inability and is trying to inspire his community members to encourage their children to better their education as their best option for adaptation.

Chief Benjamin also gave the further example of his own two brothers. Both of them were no longer living in the village at the time of the research because they are well educated, able to find jobs, and had the choice to reside in Honiara or other parts of the country. Without better education, his two brothers could not have easily migrated out from the village. If they had not been able to leave, they would have both had to compete with him for the same plot of land and thereby decreasing resources at their village. Education enabled his two brothers to find better jobs and remit funds, which currently assist him in building a sea wall and barrier against sea intrusion into the family's house during high tide, contributing towards transformation in their community.

With local jobs becoming scarce, along with resources, respondents look to good education for their children as a means of transforming their families in the face of further climate change. A young Oibolan adult testified that he was forced to leave school to work as a 'casual worker' in Auki, the capital of Malaita Province. His job for more than 15 years was 'stevedoring,' or unloading of cargos from ships at the Auki wharf. In his own words, 'I needed to support my family and so I had to leave education at a very young age'. The young man concluded that, having now realized that education is an important component of adaptation, he will ensure that his son shall not follow his footsteps of leaving school early. He stated that, although his income can now support his family, he must make sure that his son completes his secondary education in order that he can earn a government scholarship to study abroad.

The Perceived Role of Explicit Education on Climate Change and EEE

Besides the perception of the indirect benefit of education, as explained above, education helped the communities to become aware of the need to conserve their environment as part of mitigation and adaptation to the impacts of climate change. Both community leaders had shared that before the education programs were implemented, there was little awareness and understanding of the importance to safeguard the environment. Now, after the education programs, Chief Benjamin of Oibola said that people do want to participate in coral reef conservation, parks and protected areas. 'One of

the main things that contribute to establishment of coral reef conservation is that people are educated and understand the impact it will have on their children because it will provide resources in the future.'

The head teacher at Keigold Primary school, Mr. Rickson, also stated that education plays an important role in the adaptation process at the community level. The introduction of education into the communities adds value to the existing cultural learning system which the communities already have. For example, from observation, community members are easily convinced to follow what their educated elites at the community ask them to do in regards conservation, community planning and organization. If an educated community member tells the village elder or chief to conserve part of their coral reefs, then they obey and conserve the resources. This is not, however, always evident with the Oibola community, because of land scarcity and food insecurity.

Because of scarcity of marine resources, some fishermen from Oibola community resort to illegal fishing techniques. For example, some of the fishermen use explosives to kill or stun fish, mainly in the open sea, but also in coastal lagoons and coral reefs. The illegal fishing technique is used in the now devastated reefs of Langa Langa Lagoon. Explosions can produce very large craters, devastating between 10 and 20 square meters of the sea floor (Muallil, Mamaug, Cababaro, Arceo, & Aliño, 2014). They kill not only the target fish, but all the other surrounding flora and fauna. In coral reefs, reconstruction of the damaged habitats can take decades. It was reported, however, that this has now started to change after people learnt the negative impacts of these devastating acts to the environment. But if there are no alternative ways to obtain immediate resources then the pressure to do so remains high. Hence, the simultaneous need for the indirect role of education discussed above to provide other ways to obtain resources. The Langa Langa Lagoon respondents are in an extreme situation as they face land shortage. Food insecurity forces them to depend highly on cash-flow economy to survive. In such a situation, cash is needed for all livelihood activities in the lagoon. Unlike the Keigold community, which still has access to land for subsistence farming and gardening, the Oibola community depends entirely on their marine resources or cash for survival. But with a growing population, and increasing negative impacts of climate change and EEs, they are experiencing an extremely difficult time in the attempt to adapt. Against such a backdrop, these communities desperately need financial income and thus have resorted to illegal fishing techniques, as well as forcing some youth to leave school early to find employment to support their families, unfortunately repeating the pattern from past generations that so many wish to avoid. Some of these economically limited youths expressed their disappointment with the fact that their parents could not financially support them to attend higher education. They regretted having missed the opportunity of attending school, and subsequently gave up on the future chances that schooling would have provided them, such as, to migrate to urban centres and find a good job. These forgone opportunities would have helped them to ease their dependency from the community's limited resources. The interviews revealed that youths realized what education would have brought them in terms of longer-term resilience through a transformation of their lifestyle.

Discussion

This study evidences the need for further investigation of all three research assumptions. First, education was a prominent part of a pro-active process of transformation of the communities at both study sites. Both study sites and respective communities are very diverse, with different EEs and resource bases. Nevertheless, they both perceived the need for a transformation process to achieve a long-term adaptation. This indicates the need to consider the transformation of the socio-ecological

system when considering adaptation to climate change and EEEs. It is possible to argue that transformation is a critical element in the adaptation of rural communities to climate change and EEEs. It was found that villagers perceived that pro-actively transforming their lifestyle provided appropriate adaptation to reduce or transfer the risks they faced from the impacts of EEEs, for example, in case of risks from earthquakes and tsunamis, or storms surges and floods.

Second, the access to and success in formal education, in both communities were found to be a major component of the necessary transformation in their lifestyle. In remote villages where communities are faced with natural disasters, which may lead to food insecurity, there are not many options but to take whatever immediate adaptive opportunities are available, even if they exacerbate the issues over the long-term. In this local context of limited opportunities, education is seen as the saviour to most residents of rural communities. Education potentially provides options that are otherwise unavailable. These include opportunities for migration and employment to ultimately increase the economic status and adaptive capacity of the household units. These are seen as a necessary transformation for successful adaptation.

It was generally accepted in both communities and all groups that it is vital for community members to attain the maximum possible level of education to earn more income and assist their communities, for example in planning and/or implementing education programs. Respondents expected that primary school and secondary levels are only the initial stage of education for engaging in the adaptation process, and that ideally, more people in their respective communities should press on to attain higher tertiary education because it is, at this stage, at which community members are able to provide leadership in their adaptation process.

Third, formal education was seen to help people, of all ages, in the communities to understand and appreciate the value of their resources and to learn how to conserve these resources to future generations. Through gaining education and sharing experiences, villagers have realized: how natural resources and ecosystems affect each other; how resources can be used wisely amidst increasing impacts of climate change and EEEs, and; how wise use is a vital aspect for long-term adaptation at the community level.

Moreover, community members were found to be more likely to participate in the adaptation programs if they already had some formal education, and therefore some understanding of the negative impact that climate change and EEEs will have on their livelihood and communities. Since community members realize the importance of education towards increasing their adaptive capacity, education has proven to be helpful in creating long adaptive capacity towards the achievement of their own transformation to cope with EEEs.

Recommendations

From our study, we offer recommendations for governments and general research.

A) Government must ensure that rural communities are educated about conservation. Adaptation programs are necessary to ensure village support and achieve long-term adaptation. They need to be integrated into formal education in schools, but also sought to be incorporated into village activities.

B) Governments should mainstream adaptation, mitigation, conservation, climate change and natural disaster topics into the education system, both in primary schools and secondary schools. People in rural

communities will only learn the importance of education as a key means for long-term adaptation if those topics are integrated into their education system.

C) Finally, further in-depth studies are needed in order to better understand the types of transformations in lifestyle that are necessary for adaptation, and to identify the most suitable means to overcome the costs and barriers to adaptation.

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Experiential Learning and Climate Change Education: Effect of Predict-Observe-Explain Strategy on Pre-Service Teachers' Understanding of Sea Level Rise

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Abstract

This action research study examined the effectiveness of experiential learning on the understanding of climate change concepts. A Predict-Observe-Explain strategy was used to allow students to actively explore the reasons for sea level rise through teacher-guided experiments. The study employed a two-phase embedded experimental model within the framework of a mixed method design. The study sample was purposive and included all the participants of a 'Coping with Climate Change' workshop organized for the third-year pre-service teachers enrolled in the Bachelor of Education Primary program at the Fiji National University. The study findings indicate that the use of Predict-Observe-Explain strategy was useful in addressing pre-service teachers' misconceptions on the reasons for sea level rise. Study results also show that experiential learning promotes enjoyment and insight about the execution of teaching techniques in a classroom context.

Keywords: Climate change, Conceptual change, Experiential learning, Predict-Observe-Explain, Sea level Rise

Background and Introduction

Climate change education is gaining momentum in the Pacific Island Countries, including Fiji, given the vulnerability due to their small isolated nature, food insecurity and limited basic services (Pelling & Uitto, 2001). A majority of the Pacific's population live in coastal areas which makes them susceptible to the impacts of sea level rise, storm surges and cyclones (Vize, 2012).

Formal, informal and non-formal education is seen as an important way to develop within the present and future generation the skills of mitigation, adaptation and resilience to climate change. The United Nations Educational, Scientific and Cultural Organization (UNESCO, 2011, p. 221) succinctly puts in their Education for all (EFA) Global monitoring report that:

Introducing education on climate change... through formal schooling...can and should play an active role in stimulating the next generation to demand, generate, interpret and apply information on current and future climate changes, and also help in bolstering people's abilities to cope with the challenges of global warming as well as build adaptive capacity.

Primary level education is perceived as an important beginning for climate change education as all the Pacific Island Countries (except Papua New Guinea and Solomon Islands) have approximately 90% primary school enrolment rates (UNESCO, 2011) which would make this knowledge accessible to a large population.

The Republic of Fiji National Climate Change Policy (Fiji, 2012) was developed to address the issue of climate change awareness in all sectors in Fiji . Its policy objective four focuses on education and training, including the integration of climate change in school curricula, tertiary courses, and vocational, non-formal education and training programmes. The document identifies two critical strategies among others relevant to the achievement of the above objective. These strategies are as follows:

1. Review and update the current primary and secondary curricula, and the tertiary and vocational education courses to ensure inclusion of local, accurate and current climate change information, and to encourage student research around the issue of climate change.

1.1 The Curriculum Development Unit to assess and review teaching materials on climate change regularly, given the dynamic nature of climate change science, research and international progress.

2. Develop appropriate educational materials and learning tools on climate change for students with special needs in early intervention programmes, in special and mainstream primary and secondary schools, and in tertiary institutions.

(Fiji, 2012, p. 23)

Since the implementation of the National Climate Change Policy in Fiji, the Fiji Ministry of Education, Heritage and Arts has strengthened the presence of climate change and disaster risk management within the primary and secondary curriculum. Since then, several training workshops for teacher educators from all the Universities and teacher training colleges in Fiji have been conducted to best integrate climate change, climate change adaptation and disaster risk management aspects into teacher education curriculum (SPC & GIZ, 2015).

The integration of climate change education demands that pre-service teachers have adequate content knowledge and the knowledge and use of appropriate pedagogical skills to help develop conceptual understanding in learners about climate change, climate change adaptation and disaster risk reduction. Prior research (Council, 2000; Martin, 2009; Schibeci & Hickey, 2000) demonstrates that good content knowledge is necessary, however, is not the only quality of an effective teacher. These authors further assert that both content and pedagogical knowledge are important if what teachers teach is to be understood well by the learners through their own construction.

However, educating and communicating about climate change is challenging, as climate change concepts are complex and subject to unexpected feedback. Cognitive constraints are seen to be the biggest obstacles working against the adoption of mitigation and adaptation behaviours (Pruneau, Khattabi & Demers, 2008). This may imply that if teachers do not have correct subject matter knowledge about climate change phenomena and pedagogical skills, they may experience internal cognitive constraints which would then translate into their teaching and then to the learners.

This paper therefore presents the findings of an action research project concerning the effectiveness of experiential learning on pre-service teachers' content knowledge about the reasons for the climate change topic of sea level rise.

Conceptual and Theoretical Framework

This study is underpinned by the constructivist view of learning. The concept of experiential learning and the conceptual change model both served as a foundation upon which the study was grounded conceptually and theoretically.

Experiential Learning

Experiential education is a philosophy of education, described as ‘... a process through which a learner constructs knowledge, skill and value from direct experience,’ (AEE, 1991, p. 1). Experiential learning, defined in the words of Lewis and Williams (1994, p. 5) is:

...learning from experience or learning by doing. Experiential education first immerses learners in an experience and then encourages reflection about the experience to develop new skills, new attitudes, or new ways of thinking.

In the same vein, Chapman, McPhee, & Proudman (1995) define it simply as active learning that may be field based or classroom based. They caution, however, that all active learning activities may not be considered experiential learning. They postulate a list of characteristics that determine the effectiveness of activities in providing experiential learning. All experiential learning activities must include and expose learners to: a mixture of content and process, absence of excessive judgment, engagement in purposeful endeavors; encouraging the big picture perspective, the role of reflection, creating emotional investment, the re-examination of values, the presence of meaningful relationships, and learning outside one’s perceived comfort zones (Chapman, et al., 1995, p. 243). It could be argued that learning must involve pre-service teachers in activities that are ‘hands-on’, ‘minds-on’ (Llewellyn, 2002) and ‘hearts on’ to promote learning with understanding.

Facilitating learning through experience should be the goal of higher education. Kolb (1984), Knowles (1978) and others (Giddens, 1991; Heneveld, 1988; Schofield & Caragata, 1999) posit that adults learn best when engaged in individual-centered, multisensory, experiential, and collaborative lessons. Teaching through experiential learning to pre-service teachers is considered most effective in training pre-service teachers (Schwartz, 2014). Fink (2003) asserts that the quality of higher education can only be improved if one can identify ways and create learning experiences that pre-service teachers and others consider to be truly significant. This could occur in a myriad of ways, including intellectual development, cross-cultural development, career exploration, and personal growth (NSEE, 2007).

In order to develop pre-service teachers who will use experiential learning in their practice, pre-service teachers need to experience experiential learning themselves. Schwartz (2014) and Darling-Hammond (2000) argue that the most effective method of training instructors to use experiential learning in the classroom is itself, experientially. This research therefore attempts to employ this principle with the pre-service teachers who were participants of the ‘Coping with Climate Change’ workshop in order to develop in tandem their content and pedagogical knowledge necessary to teach about sea level rise (Abell, Rogers, Hanuscin, Lee, & Gagnon, 2009).

Predict-Observe-Explain (POE)

This research employed the Predict-Observe-Explain (POE) as a form of experiential learning in order to investigate the effectiveness of the POE strategy as one form of experiential learning that could help

pre-service teachers in understanding and teaching about sea level rise. POE is a learning and teaching sequence developed by White and Gunstone (1992) and was initially used by them to unravel pre-service teachers' understanding of science concepts. It has been widely used with student groups for development of conceptual understanding (Haysom & Bowen, 2010; Mthembu & George, 2001).

Moreover, POE is a teaching strategy that probes understanding by requiring learners to carry out three tasks. First, learners must predict the outcome of some event and justify their prediction (P: Predict). Then they describe what they see happen (O: Observe), and finally they must reconcile any conflict between prediction and observation (E: Explain) (Mthembu & George, 2001, p. 1). The POE therefore involves the following steps: 1. Orientation and motivation; 2. Introducing the experiment; 3. Prediction: the elicitation of Student's Ideas; 4. Discussing their predictions; 5. Observation; and 6. Explanation (Haysom & Bowen, 2010). This study followed the same sequence in the implementation of the POE activities. Research studies, which used POE with secondary and primary science children to probe children's understanding of science concepts, have been widely reported (Kearney, Treagust, Yeo, & Zadnik, 2001; Liew & Treagust, 1998; Tao & Gunstone, 1997; White & Gunstone, 1992). Palmer (1995) and Coştu, Ayas, and Niaz (2010) have used the POE strategy with pre-service teachers. It is suggested by these researchers that POE is an effective teaching and learning sequence (Liew & Treagust, 1998; Mthembu & George, 2001; White & Gunstone, 1992). In addition, Haysom and Bowen (2010) have suggested that POE technique has dual benefit in the learning and teaching process: this technique not only helps pre-service teachers to develop conceptual understanding, but is also a useful assessment tool for pre-service teachers/instructors to diagnose and address a learner's misconceptions.

Discussions also play an important role in the prediction, and especially in the explanation phase of POE (White & Gunstone, 1992) as learners tend to reconcile their prior knowledge with the observation. This is consistent with the constructivist epistemology. In essence, constructivism-oriented teaching believes that learners learn science through active involvement in the learning process (Duit, 2004; Martin, 2009). Doing experiments, participating in activities, and engaging in group discussions provide classroom-based experiential learning that allows learners to bring to the learning arena their prior knowledge, upon which, subsequent learning events rely for conceptual change to take place (Piaget, 1985).

Constructivist-oriented teaching and learning therefore aims to help learners construct their own scientific knowledge and build up their schema. It involves students' own activity, and the guidance, mediation or intervention of the teacher (Duit, 1999). As such, learning becomes a personal as well as a social process, and social constructivism embraces this process well (Vygotsky, 1978).

Moreover, verbal communication among learners and adults is a powerful force to help students acquire conceptual knowledge. The role of the teacher is important in creating a platform where learners bring their prior knowledge to deliberate amongst each other and with the teacher in the zone of proximal development to bring about conceptual change. The learner's prior knowledge strongly influences the nature of communication that would take place in the zone of proximal development (Llewellyn, 2002). POE is an important teaching activity that creates an atmosphere that fosters discussion and diversity of views (Coştu, et al., 2010). Learners' science background, amongst other factors, is equally significant in the development of conceptual understanding, however this falls beyond the purview of this study.

Conceptual Change Model

Conceptual change model (Kuhn, 1970; Lakatos, 1970; Piaget, 1985; Posner, Strike, Hewson, & Gertzog, 1982) places learners in an environment where they are encouraged to confront their own preconceptions, as well as of their peers, and then work towards developing and reconciling ideas through conceptual change. POE teaching strategy starts by eliciting learners' prior conceptions, followed by learners' re-examining their ideas in their groups and during whole class discussions. The sequence ends with attempts to resolve the contradictions between prior knowledge and the observation. As such, it is asserted that the use of POE would lead to conceptual change and conceptual understanding (Kolari & Savander-Ranne, 2003) by creating cognitive conflicts.

A plethora of science education research studies have focused on identifying and addressing pre-service teachers' misconceptions on a variety of subject matters (Duit, 2009). The area of research for this study however, is new by virtue of the topic, as climate change education has gained momentum only recently. Other studies (Gautier & Rebich, 2005; Rebich & Gautier, 2005) have explored misconceptions of learners and the general public concerning the phenomenon of global warming, ozone depletion and greenhouse effect. These studies affirmed that learner-centred instructional approach enabled learners to overcome their misconceptions.

The purpose of this study was to investigate the effectiveness of experiential learning, specifically the use of POE strategy, in facilitating conceptual change amongst pre-service teachers concerning the reasons for sea level rise. All participants were part of the 'Coping with Climate Change' workshop. The following research questions guided the study:

1. Does the POE strategy help pre-service teachers to correct their alternate conceptions of the reasons for sea level rise?
2. How do pre-service teachers perceive the use of POE technique as a teaching strategy?

Methodology

Action research was the chosen methodological approach because it makes way for instructors to translate values into practice, and gives voice to those values (Cipora, 2008). Action research has proven to be a powerful protocol for enhancing best-practices pedagogy and for guiding reflective practitioners in becoming effective change agents. Through action-reflection activity, the embodied values become clear as they emerge through inquiry (McNiff & Whitehead, 2005, p. 23). The use of POE suits action research well as it involves action-reflection activity cycles.

Cipora (2008) has used action research to investigate misconceptions and test the effectiveness of teaching strategies in science inquiry learning. Several climate change education research studies have used action research in providing experiential learning to develop conceptual understanding on phenomenon such as greenhouse effect (Duenkel & Pratt, 2013; O'Connor, Greene, & Anderson, 2006; Pruneau, et al., 2008).

Research Design

Action research falls predominantly within the realm of qualitative research (McNiff & Whitehead, 2005), this study however, employed a mixed method design. The basis for employing a mixed method design is well documented in the research methodology literature (Creswell, 2008; Davis, Smithey & Petish, 2004), including the fact that this method expands the scope or breadth of research to offset the weaknesses of either approach alone (Zemba-Saul, 2009, p. 19). A two-phased embedded experimental model in the mixed method design (Creswell, 2008) was suitable to answer the different research questions of this study.

To answer research question 1. *Does the POE strategy help pre-service teachers to correct their alternate conceptions of the reasons for sea level rise?* data was collected and analyzed in three steps: 1) Pre-testing of pre-service teachers' conceptions on the reasons for sea level rise (qualitative); 2) An intervention (POE activities to address misconceptions; qualitative + quantitative); 3) Post-test of pre-service teachers' conceptions of the reasons for sea level rise (qualitative), and; 4) Reflection on the intervention strategy (qualitative + quantitative) to answer research question 2. *How do pre-service teachers perceive the use of POE technique as a teaching strategy?*

The study embedded the quantitative data collection and analysis techniques within a qualitative data collection and analysis framework, which is common to a mixed method design (Creswell, 2008).

The study employed quantitative and qualitative methods concurrently to collect data specifically to answer research question 2. An open ended and unlimited comment field was explicitly linked to the structured response question set immediately preceding it in the form of instruction: 'explain your choice above'. According to Driscoll, Appiah-Yeboah, Salib, and Rupert (2007) and Zemba-Saul (2009) this data collection strategy has several advantages for mixed-methods applications, such as it provides an overt link to the responses of the preceding question. This technique is also 'fairly intuitive' for the participants' (Zemba-Saul, 2009, p. 21). As such, the structured question is augmented by the participants' responses to a linked unstructured question.

Study Instruments

This study collected and analyzed three forms of data:

1. Open-ended written record of participant's prior knowledge and voice recordings of informal interviews;
2. Completed POE task sheets and voice recordings of in-class group discussions; and
3. Written responses to reflection questions.

Instrument use and analysis is explained in detail below.

Firstly, to assess participants' prior knowledge, an initial engagement activity was conducted to elicit discussions on the participants' explanations for what they thought were the reasons for the rise in sea level due to global warming. Participants recorded their thoughts in writing. The researcher informally and randomly interviewed, and voice recorded participants' views to clarify ideas as they individually worked on their reasoning. A qualitative data analysis technique was used at this stage.

Secondly, a POE worksheet was developed, and the participants were divided into eight working groups. The POE activity and worksheet was completed in groups for three sets of activities designed to develop participants' understanding of the reasons for sea level rise. The analysis technique employed here was the merging of qualitative data with quantitative data to add meaning to participants' developing concepts.

Thirdly, after the completion of the POE task, students were given readings on how increasing temperature affected the different geological environments on earth. After this, students completed a set of reflection questions individually (open ended and extended response type questions) aimed at finding out whether participants could relate the concepts from the POE activities to the reasons for rise in sea level and their perception of the use of POE as a pedagogical tool. The reflection activity had the following three questions:

1. What do you think will have a greater effect in your lifetime on sea level? Melting land-based ice, melting floating ice or thermal expansion of the ocean. Explain your choice.
2. Are there any questions that you would like to ask in order to learn more about issues related to sea level rise?
3. How would you rate the POE technique in helping you understand the reasons for sea level rise? (This question used a Likert-type rated response choice of very useful, useful, somewhat useful, and not useful). Explain your choice.

It must be noted that the POE activities had intentionally not used proper science apparatus, in order to model to participants, who later would be classroom practitioners, that locally available resources can be readily used to conduct hands-on activities in primary science lessons. The activities are described below.

The Intervention: POE Activities

Participants partook in three instructor-mediated hands-on activities to investigate the reasons for sea level rise. Research (Davies, 2014; Joughin & Alley, 2011; Lythe, Vaughan, & Consortium, 2001; Ollier, 2010) reveals that misconceptions exist about the reason for sea level rise. The most common misconception is that melting icebergs cause sea level to rise when in fact the melting land-based ice (such as glaciers) and thermal expansion of the oceans is causing the sea level to rise. These misunderstandings may create a cognitive conflict (Pruneau, et al., 2008) which may impede a learner's adaptation and mitigation skills in the Pacific.

Based on the above research data on reasons for sea level rise, the following activities, drawn from the text, *Learning about Climate Change the Pacific Way: A Guide for Pacific Pre-service teachers –Fiji* (Lebars & Sabass, 2013) were implemented:



Activity 1: Investigating the effect of melting floating ice on sea level

The investigation method:

1. Filled a plastic glass with water.
2. Added 5-6 ice cubes in the glass until the water overflowed.
3. Dried the side of the container after the water was spilled over.
4. Observed the water level in the glass as the ice melted.

(Lebars & Sabass, 2013, p. 18)



Activity 2: Investigating the effect of melting land-based ice on sea level

The investigation method:

1. Filled a baking tray with water.
2. Placed a rock in the middle of the tray to represent land/mountain. Marked the water level in the tray.
3. Placed large block of ice on the Rock (the ice represented the ice sheet such as the one that covers the Antarctica).
4. Observed the water level in the baking tray as the ice melted.

(Lebars & Sabass, 2013, p. 19)

Activity 3: Investigating the effect of heat on sea level



The investigation method:

1. Took the stopper or lid of a juice bottle and made a small hole in it.
2. Put a straw through the hole and sealed the hole carefully, underneath and on top with a small amount of Blu-Tack.
3. Filled the flask almost to the brim with water and added a few drops of colouring to it.
4. Put the stopper/ lid, tightly closed the bottle and sealed it carefully with Blu-Tack.
5. Placed the sealed bottle in the sun for 2 hours and observed.

(Lebars & Sabass, 2013, p. 18)

For each of the activities above, participants had to complete a POE task sheet in their groups. Participants were instructed about the three activities and were asked to complete the prediction with their reasoning components for each of the three activities before commencing with the activities, one after the other. After every activity, participants were given time to complete their POE task sheet. During the explanation phase, when the participants were reconciling their predictions with their observations, they were encouraged to analyze, compare, contrast, and criticize fellow group member's views. The researcher made observations and interacted with the groups during this phase.

As participants were engrossed in dialogue during the predict and explain phase of the POE, the researcher voice recorded in-class discussions. Where necessary, the researcher asked probing

questions to clarify thoughts, however, always keeping in mind not to divulge the answers, but lead the participants to the accepted idea.

Sampling

For this study, the researcher considered it methodologically sound to target a specific group – in this case, the participants of the ‘Coping with Climate Change’ workshop fully funded and supported by SPC/GIZ Coping with Climate Change in the Pacific Island Region (CCCPIR) Program. The participants were comprised of 52 primary pre-service teachers who were final year students enrolled in the Bachelor of Education (Primary) program at the Fiji National University, Lautoka Campus. As such, the sampling was purposive. All participants of the workshop were included in the study to contribute uniquely towards the study findings. This sampling technique is very suitable to qualitative studies such as this study which dominantly employs qualitative data collection and analysis techniques within the framework of a mixed method design (Davis, et al., 2004).

Ethics

In accord with the usual protocols for research ethics, the participants were informed about the researcher’s intent to conduct a research during the workshop activities and sought written consent to their inclusion in the study and confirmed their willingness to participate. Assurance was given that the data collected were only for the purpose of research, and participants’ confidentiality and anonymity were fully protected (Bogdan & Biklen, 2003). They were also told that they could refuse to participate at any point during the research and could even decline to respond to any question with which they felt uncomfortable.

In addition, since the workshop was fully funded and co-facilitated by SPC/GIZ CCCPIR, approval was sought for conducting this study during the workshop. It must be noted that the researcher, among others, was a key facilitator for the workshop.

Moreover, participation in the workshop was voluntary and was not a component of the participants’ academic requirement as a student enrolled in the Bachelor of Education (Primary) program at the University.

Significance of the Study

This study was important for several reasons.

Firstly, it provided a platform to unveil participants’ preconceptions on the causes of sea level rise. Recognition of learner preconception is well supported in the literature for effective science learning and teaching, which recommends a constructivist view of learning where science lessons begin by acknowledging prior knowledge of learners (Duit & Treagust, 2003; Skamp, 2004).

Secondly, since Fiji, like many other Pacific Island Countries is vulnerable to climate change, and most affected by sea level rise, this study addressed misconceptions the participants had on the reasons for sea level rise. As a result, it is anticipated that the participants will become sensitive to the issues of climate change, and in their capacity as future classroom teachers be curious to learn more about climate change. Capacity building of teachers is an objective in Republic of Fiji National Climate Change Policy (Fiji, 2012).

Thirdly, this study provided an opportunity for the researcher, who is a primary science educator, the opportunity to implement and reflect on the experiential learning in the form of POE strategy. Since the purpose of action research is to improve practice, the lessons learnt from the implementation of the POE activities could be purposefully used to reconsider and revise content and pedagogical approaches to science education currently practiced at the university.

Findings and Discussions

Initial activity – Participants’ prior knowledge and explanation for the reasons for sea level rise

The result from the pre-service teachers’ open ended written responses to the initial engagement activity revealed that all the participants identified melting icebergs and/or ice caps or glaciers as the prime cause of sea level rise. Random informal interview of 30 participants showed that most participants simply used the terms icebergs and or ice caps and or glaciers synonymously. As one participant explained:

P1: Icebergs, ice caps and glaciers are ice that is found in the North and South Pole which is melting due to global warming.

P2: Glaciers are glassy ice, and ice caps and icebergs are same... they are found in the sea.

P3: They are ice that floats on frozen sea.

P4: Glaciers are found on the mountains.

P5: Ice caps are icebergs in the oceans near the poles.

The participants innocently thought that glaciers, icebergs, and icecaps were frozen water and location of the ice did not make a difference as long as it was in the Polar Regions and was melting due to heat. During class discussion and rounding up of the initial engagement activity, all participants affirmed that the earth is heating up due to global warming. As a result, this excess heat is absorbed by the ice causing it to melt. It must be noted that none of the participants related the cause of sea level rise to thermal expansion which contradicted their predictions for activity three on investigating the effect of heat on sea level.

Analysis of the POE Tasks

Activity 1 -Investigating the effect of melting floating ice on sea level

Prediction:

87.5% of the sample groups (n=7) predicted that water will flow out of the cup, while 12.5% (n=1) predicted that water level will go down. The common reasons for the prediction are summarized in Table 1.

Table 1

	Water level will rise/Water will flow out of the cup	Water level will go down
Predictions	87.5%(n=7)	12.5% 9 (n=1)
Reasons for Prediction	-ice will melt and change to liquid -will add to the water in the glass	when water is in solid form it takes more space than in liquid form
Explanation and reconciling	-the ice melted but did not overflow because melting ice covers up the space that was taken up by the frozen ice (75%; n=6) -*when water is in liquid form there are spaces within it and when the ice melts, the water particles from it move into the space in the liquid water, therefore it accumulates with in the cup and does not overflow (12.5%; n=1)	Amount of space taken by the ice is equal/less than to when it liquefies (12.5% n=1)

It was interesting to note that all participants were unaware of the concept of displacement. This is a common misconception in science where pre-service teachers appear to ignore the amount of space taken up by objects when immersed in a volume of liquid, as reported elsewhere (Allen, 2014; Duenkel & Pratt, 2013).

The group that had predicted that the water level would go down, however, gave reason for their explanation that was quite sensible and showed evidence of scientific thinking. This group, through informal interview explained their reasoning:

G1: When ice freezes, its volume increases, so when it melts it will occupy less space in liquid form, so the volume should decrease.

These responses from participants is evidence that POE encourages learners to acknowledge their prior knowledge and think scientifically, thus actively engaging pre-service teachers mentally and physically in the learning process (Duit, 2004; Martin, 2009; Posner et al., 1982).

Observation:

The pre-service teachers were surprised to observe that the ice that was floating in the cup that was full to the brim with water did not overflow as it melted. They observed the glass until all the ice had melted

to believe the result. There was an air of excitement as pre-service teachers were in a state of disequilibrium (Posner, et al., 1982).

As was expected, this initiated a lot of in class discussions as it contradicted their predictions. Many groups sought confirmation from the workshop facilitators about the accuracy of their observation. This action of participants clearly portrays that preconceptions are passionately held by learners and often resistant to change (Duit & Treagust, 2003; Skamp, 2004).

Explanation:

In this stage, participants appeared compelled, intrinsically, to discuss and look for plausible explanations of the observations made. This is arguably what Posner, et al. (1982) described in the third stage of the conceptual change model - learner's re-examine their ideas. Cognitive conflict appeared to excite the participants to engage in dialogue (Kolari & Savander-Ranne, 2003), and this was an important phase for conceptual change to occur.

Table 1 above summarizes the common explanations negotiated by the group. The table shows that 12.5% (n=1) of the sample had misconceptions on particle theory of liquids and could not recognize the concept of displacement. They assumed that when the ice melts it fitted itself in between the particles of liquid water. However, 75% of the groups (n=6) were able to correctly explain the concept of displacement while another 12.5% (n=1) appeared to develop a partially correct notion of displacement. They could not recognize that the ice does not displace all its volume in water as part of it is still above water.

The explanations phase made implicit ideas explicit. For conceptual change to occur, students' ideas and thoughts regarding their observation in relation to their prediction is critical. POE provides the platform to consciously think about their own ideas. As participants were engaged in dialogue during this phase, looking for plausible explanations for their contradictory observation, it unearthed other misconceptions held by participants' such as in the particle theory of matter. This type of information is very useful to teachers when planning to teach, indicating the usefulness of the POE strategy.

Activity 2: Investigating the effect of melting land-based ice on sea level

Prediction:

100% of the sample groups (n=8) predicted that water level in the tray would increase. The groups were absolutely sure that water level will increase.

Reason for Prediction:

All the groups' reasonings were common. They all reasoned that the ice, when it melted from the land, would add extra water into the tray. Given below is a response from one of the groups:

G1: melting ice from the land as it melts and flows adds extra water to the tray.

Observation:

The water level in the tray had increased after the ice had melted.

Explanation:

The explanation for the observation was simple as the observation did not create any conflict between the participants' prior knowledge. Some of the explanations are as follows:

G1: The water was excess and was on land that flows into the sea. So it adds to the volume of water in the ocean.

G2: The melted ice from the land drains into the sea. This causes sea level to rise because melted ice from land is added to the sea level already present.

At this point the researcher gave additional reading on icebergs and glaciers to clarify and confirm to participants the reason why melting icebergs do not cause a rise in sea level whilst melting glaciers and land-based ice sheets do.

Activity 3: Investigating the effect of heat on sea level

Before introducing this activity, the researcher had shown statistical information on how the different surfaces of the earth absorbed heat due to global warming. The data showed that the ocean absorbed about 93.4% of all the heat trapped in the earth's atmosphere (Cook, 2011). Having done that, it set a platform for investigation and discussion on how water behaved due to heat absorption.

Prediction:

37.5% of the sample groups ($n=3$) predicted that the sun will absorb water through the tube/ the water will evaporate. While surprisingly 62.5% of the sample groups ($n=5$) indicated that the water level will increase and or the water will climb up the tube. This prediction was correct, but it contradicted participant's lack of association of thermal expansion to reason for sea level rise from the initial engagement activity.

Reason for Prediction:

Although most groups had made correct predictions, the same was not true for their reasons. Many groups ($n=3$) associated the increase in volume to particle expansion due to heat. Misconceptions associated with the notion of particle expansion are shown in the expressions below:

G1: when particles of water get hot they expand....

G2: the particles become bigger....so take up more space.

This shows, yet again, misconception on the particle theory of matter. Several studies on understanding of particle theory indicate this to be a common misconception amongst learners (Niess, 2011; Perkins, 1993).

Through informal discussion it was noted that participants were familiar with this activity. As succinctly articulated by many participants as a reason for their correct prediction:

P1: Oh... I know it because we did this experiment in primary school...

This is an indication that hands-on activities done in school lack meaningful connections to real life experiences. Implying that participants' prior experiences in science education in primary schools did not link 'hands-on' with the 'minds-on'. Scientific investigations must relate to real life context for

meaningful learning to take place. Although, most participants recalled the activity and its result, which they used to make their prediction, the underlying concept of the observed result was not understood. Hence, distinguishing learning with understanding from learning without understanding. In this case, implying that 'hands-on' activities alone are not a guarantee that learning with understanding will take place. Instead, mental engagement in the form of predictions, explanation, and discussion along with hands-on activities provide a stimulating environment in which learners acquire knowledge.

Observation:

The water rose up the straw when kept in the sun for two hours.

Explanation:

All the groups (n=8) explained that sunlight made water particles gain heat energy, thus it expanded. The use of particle theory of matter was evident in the student's explanations albeit the notion of expansion of particle was contradictory. The researcher noted this but did not see it appropriate to address the misconception just yet.

The POE activity made the participants think critically when predictions did not match observation. For instance, the group that had earlier predicted that water level will go down, ruled out the possibility of evaporation after a critical reflection of the way the bottle was sealed to prevent water evaporation. The disequilibrium that predict and observe stage creates in the POE is very useful in mental and physical engagement of learners.

Reflection Activity

Reflection from the learning experience was important to gauge the effectiveness of the POE on participants' understanding of sea level rise. The result of the reflection is discussed below.

Question 1

What do you think will have a greater effect in your lifetime on sea level? Melting land-based ice, melting floating ice or thermal expansion of the ocean.

The result showed that 22.5 % indicated both melting land based ice and thermal expansion of the ocean affected sea level, 32.5% indicated that melting land based ice will contribute greatly to sea level, whilst, 45% attributed thermal expansion as having the greatest effect on the sea level.

Interestingly, none of the participants indicated that melting floating ice in the ocean was a contributor to sea level rise. This indicated that participants were able to correct their misconception about the reasons for sea level rise. In activity one, all participants were sure that melting floating ice (icebergs) was responsible for rise in sea level, but in this reflection exercise none of the participants indicated melting icebergs to have an effect on sea level. This shows that conceptual change has occurred.

Question 2

Are there any questions that you would like to ask in order to learn more about issues related to sea level rise?

The open-ended nature of the item brought about many questions worthy of further investigation. Many participants (80%) responded to this question. This response rate suggests that the experiential

learning had encouraged inquisitiveness and eagerness to learn more about related climate change concepts. Some interesting questions such as the following were asked:

P1: Are the glaciers different from Greenland ice sheet?

P2: Why are the countries in the Pacific mostly affected by sea level rise... such as Kiribati?

P3: Is sea level rise affecting Fiji....which places?

P4: Does thermal expansion harm sea creatures?

P5: Doesn't greenhouse effect cause sea level rise?

P6: What about ozone depletion...does it have any effect on the sea level rise?

These questions reflect the effectiveness of the use of POE activities on participants' personal learning. The nature of questions asked reflects elements of critical thinking and inquisitiveness to learn more. These characteristics in learners develop only when learning with understanding has taken place. This indicates that conceptual change about the reasons for sea level rise had taken place, hence the desire to learn more. The questions posed by participants would encourage further inquiry.

Question 3

This question focused on participants' perception on the use of POE to investigate their understanding of sea level rise.

Question 3a

How would you rate the POE technique in helping you understand the reasons for sea level rise?

All the participants found the use of POE very useful. Since POE employs a 'hands-on' and 'minds-on' approach to learning, it was aesthetically appealing as indicated in their extended responses.

Question 3b

Explain your choice above.

In their justification to the opinion of the POE technique, some common responses from participants were:

P1: It was interesting and simple to do.

P2: It showed me my misconception... relates to the principles of constructivism...

P3: Its hands-on....and organized.

P4: I will use it in my teaching when I get posted.

P5: I learnt science through active learning; POE is cool way of learning...

P6: POE is so easy to use...children will find it interesting too.

P7: There is a lot of group talk and thinking...

P8: ... not only is it engaging...it also promotes further inquiry.

These comments indicate that mental stimulation through organized hands-on activities were appreciated by pre-service teachers. Through their experiences they understood how the POE can be executed with children. This is the aim of experiential learning: giving pre-service teachers experiences in the context of learning science concepts so that they can feel the effect of the activity as well as reflect on the instructional demand necessary to replicate this technique in their classroom practice.

Conclusion

The POE strategy is a useful strategy and has significance in addressing misconceptions. It also is a potential pedagogical tool to provide experiential learning to pre-service teachers. This study shows that the use of experiential learning improves and deepens trainee pre-service teachers' understanding of the concept of the sea level. The POE strategy provides pre-service teachers with hands-on and minds-on engagement which has aesthetic appeal (hearts-on). Therefore, experiential learning provides a fun learning environment and reveals and addresses pre-service teachers' misconceptions. It also encourages critical thinking.

Although, this study is limited by the size of sample, its implication is immediate and can be used to inform practice (Cipora, 2008) because the purpose of action research is to inform and enhance the teaching and learning process. Continuous repetitions of these snapshots would, however, provide a better idea of what is going on. Despite this limitation, the use of POE strategy has proven to be significant to addressing misconceptions. Therefore, the use of experiential learning via use of POE is recommended as worth exploring in teacher training institutes where didactic instructional practice is dominant (Pruneau et al., 2008) because experiential learning provides pre-service teachers with lived experience of teaching techniques that can be replicated in their classroom teaching.

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Critical Reflections on Online Learner Support Programmes at the University of the South Pacific

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Abstract

Learner support has been described as the provision of support programmes by an educational institution to facilitate and enhance students' learning experiences. At the University of the South Pacific, Student Learning Support (SLS) presence is quite strong at its main campus in Laucala since staff and resources are physically situated here. Similar opportunities have not been available to students at the other campuses until 2017. Students at these other campuses thus have been heavily reliant on face to face visits and for support that was provided online. Some online platforms providing this support have been REACT – a video conferencing tool, Moodle and email communication. In 2015 the Faculty of Business and Economics SLS managed to support some students at the Alafua and Emalus campuses through REACT and email. While these support mechanisms had been the same over the years, a different approach was undertaken this time. This paper describes the learning support process provided to students and recommends that students need to be 'pushed' into using such services.

Introduction

The purposes of this article are two-fold. First, it describes the efforts undertaken by the Faculty of Business and Economics' Student Learning Support (SLS) section to provide students who are located away from the main campus of the University of the South Pacific (USP) with online learner support opportunities. Second, it postulates that student use of online learner support facilities can be encouraged through embedding academic skills into course curriculum components, and by making the exercise of seeking such learning support mandatory for specific aspects of an assignment.

Learner support has been broadly described as the interactive processes between the learner and the institution that supports learning (Tait, 1995, p.232) and can be categorised into two main areas (Thorpe, 2003, p. 203). One comprises elements relating to course administration such as course counselling and enrolment. The other category consists of pedagogical activities such as study and numeracy skills, strategies for coping with tertiary studies, and self-management, which enable the successful completion of a course. For distance and flexible learners, where the traditional face to face support may not be frequently possible, technology-based pedagogies need to be provided so that students are able to experience similar interactive opportunities as face to face students.

Over time, there has been much reconceptualisation of the term 'learner support'. Tait's (2014, pp. 9-10) outline of the various historical phases experienced by UK's Open University support model reflects its transition from an autonomous structure to one that integrates study skills with course components. This shift is an important realisation of the role that academic skills play in fulfilling course assignment requirements. By treating academic skills as complementary to course content, students learn how to

generate knowledge as circumscribed by the discipline allowing them to address assignment instructions according to expectations of the course and lecturer.

The provision of learner support services is considered quite instrumental in aiding the learning process for a student, however, these services remain underutilised for various reasons. According to De Fazio et al (2000, p. 6) students usually carry a 'quick fix' attitude which prevents them from developing appropriate study skills and continuing with such support. For students from the Pacific, such as those at USP, their inability and reluctance to incorporate learner support for the duration of their studies can be attributed to poor self-management skills (Hogan, 2010). Anae and Sua'ali'i-Sauni (1996), Koloto, Katoanga and Tatila (2006) mention the desire for culturally specific support which may not always be available. Such support requires creating a culturally relevant environment (Chu, Abella, & Paurini, 2013) where students' preferred learning styles are recognised and considered for further learning opportunities.

Another reason attributed to underuse of learner support services is the perception that such services are intended only for students who are at risk of failing their courses (De Fazio et al, 2000). This in turn creates the image that learner support functions as a remedial provision. This attitude can be prevalent among students as well as staff.

Background

The University of the South Pacific (USP) serves 12 South Pacific island countries and has a total of 14 campuses, with 3 located in Fiji. Student Learning Support (SLS) services were established quite early at USP. It was initially known as the English Resource Unit (ERU) (Khan, 2000, p. 45) but underwent two name changes, becoming the Centre for the Enhancement of Learnings and Teaching, and Centre for the Excellence in Learning and Teaching (CELt) until it became known as Student Learning Support or SLS. SLS was decentralised in 2009 into the respective faculties of the university as part of a restructure process. This shift was intended to redirect the usual practice of providing generic skills to those that were learner focused and discipline oriented and thus in line with the new conceptual model described by Tait (2014). SLS offers three main programmes. These are academic and study skills sessions, a Peer Mentoring programme - which is complemented by the Peer Assisted Study Sessions (PASS) - and individual or one on one academic support for assignments and writing.

SLS extends these programmes through online modes for students who are not able to attend sessions and for those studying at the other campuses since there had been no stable SLS presence at the sites. These modes are: email for specific requirements pertaining to assignments and study skills; Academic Skills Workshops conducted through a video-conferencing platform known as Remote Educational and Conferencing Tool (REACT); typically one outreach visit per semester to an outer campus with face to face support taking place for the week. An e-mentoring support programme also exists (Anzeg, Sharma, B., Sharma, A., 2016) but this has been exclusive to students undertaking courses with the Faculty of Science, Technology and Environment (FSTE) of USP.

SLS has always been physically located at the main campus in Laucala, Fiji. As a result, students at the other campuses have been denied the level of support received by students at the main campus in Fiji. Two exceptions remain. Emalus campus (Vanuatu) had an SLS staff member from around 2006 until 2013. Meanwhile, the SLS staff based in Alafua campus (Samoa), also since 2006, was relocated to Laucala campus in 2010. In order to provide equitable SLS support services in the outer campuses and in

accordance to the *USP Strategic Plan 2013-2018*, Priority Area 2, Objective 5 (University of the South Pacific, 2013, p.24), SLS centres were established for the Lautoka (Fiji) campus in 2015, the Kiribati campus in 2016 and the Emalus, Honiara (Solomon Islands), Alafua (Samoa) and Labasa (Fiji) campuses in 2017.

Learning Support has always been under used by students based at locations away from Laucala campus (Commonwealth of Learning, 2014, p. 21). Reasons range from absence of SLS staff at the larger campuses to enable face to face contact, students being expected to access support through their own initiative, poor internet accessibility and irregular email communication between SLS staff and students. The latter is again compounded by travelling expenses and accessibility to computers.

There are a number of external reasons for poor attendance during REACT sessions as well. One of the reasons is that priority for booking REACT sessions are always given to academic courses. The remaining slots are then availed for other sections or groups who intend to use them. Usually the slots that are available are those that are either during the early hours or late hours of the day. SLS staff experienced this issue when attempting to schedule Academic Skills sessions. These times tend to make it difficult for students who travel from remote locations to attend sessions. Time differences between some campuses and Laucala also impacts attendance (Yusuf, 2009). Additionally, due to limited funds to support their travelling expenses, some students only visit the campus when they have classes (Napwatt, 2008).

Low attendance in learning support sessions can also be attributed to lack of motivation, low priority given to study skills sessions and poor self-management skills where organising study is concerned. To combat this situation, academic staff are requested to assist and promote SLS services and encourage students to attend sessions. In many cases, however, students are expected to regulate their attendance at these sessions since successful online and distance learning relies on the expectation that learners will take responsibility for managing their own learning (Moore, 1973).

ICT Use at USP

USP has two network infrastructure systems, AARNET (LAN), which facilitates internet connectivity and USPNet (WAN) a satellite based communications network (Bhartu, 2016). In its efforts to provide learners with interactive online learning platforms, there have been consistent upgrades and maintenance to USPNet to ensure that communication services are adequate and able to sustain distance learning (Chandra, Koroivulaono & Hazelman, 2011). There was also an increase in internet quota in 2014 to allow students to continue benefitting from internet facilities.

Despite upgrades to USPNet (Chandra, Koroivulaono, & Hazelman, 2011) internet connectivity can be very slow in many of the small island campuses having serious use implications for students. For example, Koroivulaono (2014) found through her study that online courses with large sized resources posed problems with downloading for students in the outer campuses. Furthermore, student use of internet is controlled by student quota which may be reserved for core components like completing activities for academic courses on Moodle. As such, students may not want to use their quota for additional, supplementary resources and activities that support their learning.

Other considerations for ICT use by USP students depend on student preparedness (Moala, 2002, p. 448) and the need for appropriate and relevant pedagogy and cultural inclusivity (Thaman, 2001, pp. 9 - 10).

The latter has been an underlying concern for Pacific students, and has been repeatedly raised with regards to marginalising students, who not only are accustomed to teacher-controlled learning environments, and therefore need a more socially constructed environment for learning. Thaman maintains this may not be always possible through online platforms. Recent studies regarding ICT use at USP, however, show a change in learning preferences. For instance, Raturi, Hogan and Thaman (2011) demonstrate through a survey that USP students claim readiness to use ICT at USP. Reddy and Sharma's (2015) study, which documents students' use of mobile devices such as the tablet computer, supports and validates that Pacific students are very enthusiastic about learning through such modes. Additionally, Evans (2002, p. 461) reports that facilities such as teleconferencing actually enable students to break away from cultural passivity that are usually nurtured through traditional modes of learning and teaching.

ICT use at USP has both its advantages and limitations for students. The fact remains, however, that for students who are not able to easily access resources, ICT may provide the necessary support for successful completion of their courses. In fact, ICT should be maximally used to ensure that all forms of support are accessed and the learning process remains unaffected.

Active Intervention for SLS

SLS had been conducting weekly Academic Skills sessions for students throughout the semesters since 2010 for students located at the other campuses through REACT but this service was stopped in 2015 due to the challenges experienced in coordinating the activity. SLS also communicates with students requiring one on one academic support through email and this too has remained relatively low. Students are informed of these services through their course outlines at the start of the semester. Information details include name and contact details of faculty SLS staff to whom students can refer for academic support. Students and staff are also informed of the Academic Skills sessions through an All Staff and Students email. For outside Laucala, SLS staff coordinating this activity informs Campus Directors about the sessions. The Campus Directors then inform staff at the campuses to ensure that students are aware of the sessions and are encouraged to attend.

Two major online mechanisms have been used over the years until 2015 and the section below outlines a change in learner use as a result of intervention initiatives by course lecturers in semester 2, 2014. An analysis of student attendance for REACT sessions for a period of 6 years consistently shows low attendance of students outside of Laucala Campus, with the exception of the increase in semester 2, 2014.

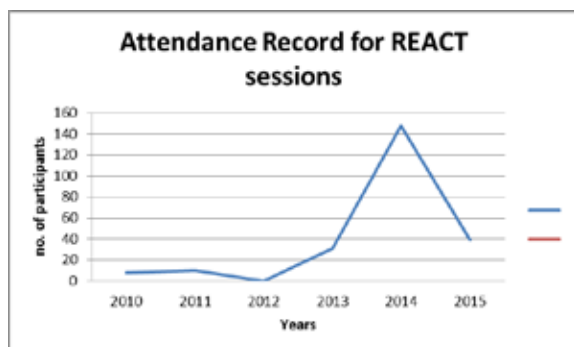


Figure 1. Student Attendance during REACT based Academic Skills sessions by SLS, USP

There have been no active surveys undertaken to ascertain actual reasons for such low attendance, however, anecdotal evidence from students was consistent with research evidence (Evans, 2002, p. 454) for ICT use in regional campuses.

It is noteworthy that attendance in 2014 was relatively higher in comparison to the other years for both the Alafua and Emalus campuses. A single factor contributed to this increase and its non-existence in 2015 led to the drop in attendance as is evident in the chart. In 2014, two academic staff took on the responsibility of leading students to SLS services. REACT sessions were scheduled specifically by the Faculty of Business and Economics (FBE) SLS staff. Through email correspondence, two academic staff were identified (one from Alafua and one from Emalus) who could work with the FBE SLS staff. These staff members were informed of the academic skills sessions and they took on the responsibility of ensuring that students attended these sessions. In fact the students were told that the sessions would help them in their upcoming assignments (Refer to workshop titles in Table 1 below).

As is listed in the table below, attendance was at an all-time high. In total, there were 117 students from Alafua campus spread over for three sessions, and 31 from the Emalus campus for one session. An FBE SLS staff visited the Alafua campus and as part of their outreach programme conducted a few face to face academic skills sessions. It was noted that attendance for REACT sessions after this did not attract similar numbers to that prior to the visit to Alafua. The Emalus campus students had attended in response to an assignment requirement and thereafter their numbers declined too. This situation brings to light two important points to consider when planning a REACT session. First, academic staff need to incorporate the SLS session into their own course curriculum and ensure that students attend sessions. Secondly, it seems that students need to be escorted for such activities otherwise they are unlikely to take the responsibility to attend them. The table below lists the student number that attended for each session during semester 2, 2014.

Table 1: Attendance Record for Academic Skills sessions semester 2, 2014

Date & Time	Workshop Title	Attendance
Wednesday 6th Aug	Time Management, Study Strategies and	37 (Alafua Students)
10am-11Fijitime	Avoiding procrastination	
Thursday 14th Aug 10am-11FJT	Unpacking Assignment Questions and Assignment Planning	55 (Alafua Students)
Thursday 28th Aug 10am-11amFJT	Active and Critical Reading	25 (Alafua Students)
Thursday 18th Sept 10am-11amFJT	Argument Development and Referencing	30 (Emalus Students)
Thursday 2nd October 10am-11amFJT	Writing Literature Reviews	1 (Emalus Student)
Thursday 16th October 10am-11amFJT	Transforming notes for study purposes	0 Attendance
Thursday 30th October 10am-11amFJT	Preparing for Exams	0 Attendance

A similar initiative was undertaken by another academic staff from the Alafua campus in 2015 for a 300 level Agriculture course. There were seven students altogether in this class and were working on their assignment, which was a research proposal. The lecturer advised his students to seek SLS support in writing, referencing and proposal structure. Language use is a concerning issue for students, especially those located on the outer campuses. Students are asked to visit SLS for language and assignment structure support. Another problem that the academic staff had brought to light was use and referencing of sources. Students have been found to be quite careless and inconsistent in their use of referencing. To address these issues in his students' assignments, the instructor made it mandatory for them to seek SLS services prior to the submission of their assignment. The students were provided with SLS staff email and were expected to seek support. The SLS staff was also expected to provide feedback to the academic staff on which students had sought support. Students were advised by their lecturer that this form of assistance would positively impact their language and grammar, as well as referencing and essay structure marks, which in turn would impact the overall assignment mark. All seven students sought support through email where SLS staff was able to provide feedback on language use and structure of the assignment. In some cases, students returned to SLS to review their reworked drafts. This proved quite helpful for the lecturer. It also enabled the submission of a better written assignment for the students. The lecturer subsequently reported that "...Students are happy with your assistance, and they made substantial improvements." (Kant, personal communication, March 31, 2015).

As with staff intervention for the Academic Skills sessions, embedding SLS for some aspects of assignment tasks enables students to benefit from services available to them. Furthermore, there is a higher likelihood that some students may continue to seek support for other assignments. This was evident in semester 2, 2015 where two of the seven students from the 300-level agriculture course sought SLS services for new course assignments through email.

Self-Regulation

Self-regulation is essential for academic success (Brookfield, 2013), and needs to be nurtured in students who are studying through distance and online modes (McMahon & Oliver, 2001).

Self-regulation maintains that learners assume responsibility for their own learning. They proactively seek knowledge and seek to identify and improve gaps in the knowledge acquisition process (Zimmerman, 1990, p. 5). Zimmerman further argues (1990, p. 5) that this attitude is present in most learners however, the systematic use of behavioural, metacognitive and motivational strategies are more apparent in learners who are deemed to be self-regulated. The motive to self-regulate is stemmed in external rewards and the continuous urge to motivate the self towards higher learning goals after accomplishing existing goals.

For academic study to be successful, learners therefore need to seek out support services that can ensure that they are adequately equipped with effective learning strategies and academic skills. The fact that students needed to be led to REACT sessions and that SLS support was made mandatory for some aspects of an assignment, suggests that most students do not actively nurture self-regulatory traits in themselves. If they are not able to attend REACT sessions, they could resort to email correspondence with their faculty SLS staff for additional assistance and resources, however, as records show, this only eventuates when lecturers require them to seek support. While Moore (1973) explains that students studying through distance modes are expected to assume more autonomy, Field, Duffy and Higgins (2014) maintain that nurturing self-regulated skills cannot be left to the learners' responsibility. It is necessary that academic staff build course components that allow students to learn self-directed skills and use support services when necessary for the successful completion of the course. This point strongly echoes sentiments for culturally relevant support for Pacific island students stated earlier. The perception seems to be that Pacific students are passive learners who need to be coerced into participating in support activities. Thus without the 'push' from course lecturers to seek out additional assistance, very few students will take the initiative to actively pursue support which identifies improvement areas on assignments or other study skills.

Conclusion

USP has ensured that online mechanisms and learning support are available and accessible for its students to benefit from all learning opportunities. This article has raised the issue that despite the availability of these resources, students continue to under-utilise them, which consequently prevents them benefiting from adequate support. One of the reasons attributed to this situation is the expectation that students will seek support through their own resourcefulness. Following this, the second reason is the possible poor self-regulation on the part of students which could otherwise motivate them to seek additional support for their studies.

Now that most of the larger campuses have their own SLS centres with full time staff in place, students will have greater access to face to face learning support services. However, SLS activities will only become meaningful if students are encouraged to use their services to the fullest capacity. As such, this article recommends stronger collaboration between academic and SLS staff to identify approaches that would work in the students' best interest. There is a further need for staff to actively nurture intrinsic attributes such as self-regulation.

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