Anonymous online peer assessment in an undergraduate course: An analysis of Students’ perceptions and attitudes in the South Pacific

Krishan Kumar
School of Computing, Information and Mathematical Sciences, The University of the South Pacific, Suva, Fiji
krishan.kumar@usp.ac.fj

Bibhya Nand Sharma
School of Computing, Information and Mathematical Sciences, The University of the South Pacific, Suva, Fiji
bibhya.sharma@usp.ac.fj

Salsabil Nusair
School of Computing, Information and Mathematical Sciences, The University of the South Pacific, Suva, Fiji
salsabil.nusair@usp.ac.fj

Gavin Jahir Khan
School of Computing, Information and Mathematical Sciences, The University of the South Pacific, Suva, Fiji
gavin.khan@usp.ac.fj

Abstract— This paper provides insights on students’ perceptions and attitudes on anonymous online peer assessment. Peer assessment tools are being utilized in higher education in the information age to improve student learning experience by enabling a predominantly learner centered environment where students are actively involved in learning and the feedback process. This study aims to explore students’ perception and attitude of online peer assessment strategy in an undergraduate course offered in online and blended modes to students from twelve Pacific Island Countries (PICs). An online questionnaire was administered at the end of the assessment process to a sample of 1160 students out of which 846 completed the survey with a response rate of 73%. The data was analyzed using descriptive statistics. Results from this study indicated that the students had a favorable perception and attitude towards online peer assessment method when assessor and assessee are kept anonymous. The online peer assessment strategy also motivated students to learn, improve their understanding of the formative assessment and develop metacognitive skills.

Keywords—Peer Assessment, Perception, Attitude, Blended Course

I. INTRODUCTION

With the rapid advancement of Information and Communications Technology (ICT), learning and assessment methods have changed dynamically. New learning assessment tools have likewise emerged in this Information Age for Generation-Z learners to take advantage of [1]. The learning modes have shifted to blended and online where studies have shown that these two learning modes have positive impact on student learning and have improved the collaboration between the learners and facilitators [2] [3]. The use of online instruction comprises of elements such as emails, chat rooms, bulletin boards and online discussions that can promote learner-instructor and learner-learner interactions [4]. In addition, [5] suggested that online forums encourage learners to engage in discussions which in-turn improve their communication skills. Peer assessment has become one of the latest assessment tools in this 21st century of learning, and it aims to transform students from passive receivers of knowledge to active learners and participants in learning, creation and evaluation processes [6]. According to [7], peer assessment is where individuals make judgments about the peers’ work following a set criterion and may also provide feedback about the work they grade.

Research has shown that peer assessment strategies have positive impact on student learning [8] [9] [10] [11]. It not only supports student participation but also empowers them to take responsibility of their own learning, develops better understanding, increases capacity for critical thinking and analysis, which contributes to the development of lifelong learning skills [12]. Due to growing demand from employers and other industry stakeholders that graduates should be equipped with transferable skills [13] [14] including communication, critical thinking, teamwork and self-management skills before joining the working sector, there has been a concerted effort by Higher Education Institutions (HEI) including The University of the South Pacific to further advance towards designing curriculum and effective assessments that develop the same skills while enhancing student learning experience. This effort has been reinforced by linking these skills to graduate attributes which are an essential part of every academic program on offer [15], [16] [17]. Online peer assessments serve as an avenue for developing such skills.

Despite the various benefits, peer assessment is faced with challenges such as anonymity of assessor and assessee, accuracy and validity of the feedback given to learners, the tendency to over mark and under mark and the challenge of following the marking guide/rubric, which to some extend might be difficult for the learners to interpret considering how well they may have understood the assessment and related concepts initially [18]. While research has shown that peer assessment has been an effective tool in evaluating student assessment in this ‘Information Age’ [11], researchers [11] have identified that student perceptions and attitudes are potential impediments to successful implementation of online peer assessment strategy at HEI. Understanding student perceptions and attitudes will enable the educators to improve the design and delivery of online peer assessments.

Overall, this research paper aims to address the perception and attitude towards anonymous online peer assessment strategy in an undergraduate course. The case study is a generic undergraduate course from The University of the South Pacific (USP). This research survey was conducted immediately after students’ engagement in anonymous online peer assessment activity using a feature of a popular Learning Management System (LMS) namely the Moodle Workshop Tool [19]. Given the aforementioned aim of this study, two main research questions guide this research to understand the effects of anonymous online peer assessment:
RQ1. What are effects of anonymity of assessor and assessee on students’ perceptions?

(RQ1a); adequacy of training and support and

(RQ1b); fairness of peers marking?

RQ2. What are effects of anonymity of assessor and assessee on students’ attitudes towards online peer assessment strategy?

The remaining sections of this paper is organized as follows. We first present the background in literature of peer assessment. We then detail our research method, followed by results, discussion and implications. Finally, we end the paper with conclusions, limitations and future directions.

II. BACKGROUND

This study involves participants from USP, which is a premier higher education provider for the south pacific region. USP is jointly owned by the twelve member countries comprising of Cook Islands, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu and Samoa and has campuses in all member countries of which the main campus (Laucala Campus) is located in Fiji.

With the latest development in technology and structure of network services at USP, the university provides advanced communication through a satellite network known as USPNet to facilitate distance and flexible learning [21]. USPNet is an USP owned Wide Area Network (WAN) which incorporates a 5MHz IP Satellite based technology to deliver and integrate distance learning, educational and administrative services throughout its twelve member countries and fourteen campuses. This service provides the opportunity to its staffs and students to participate in interactive video conferencing tutorials, communicate by e-mail with a lecturer, facilitator and another student, access the World Wide Web (WWW), access online Management Information Systems and student banner applications, watch a live/recorded video multicast and access multimedia material via server downloads [22].

The university has taken advantage of the new developments in technology and has introduced new teaching and learning pedagogies and tools to support learning [23] [24]. It offers courses to the students in face-to-face, blended, online and more recently in cohort-based delivery modes [25]. According to [26], USP has a strong learner-centered approach to teaching and learning and aims for the highest standards of creativity, teamwork, innovation, cooperation and flexibility in the pursuit of student excellence. To achieve this, a number of ICT tools is being utilized by the course coordinators. Peer assessment is one of the assessment strategies which can be used by course coordinators of blended and online courses at USP through LMS. Since, the students are enrolled from all the campuses in the region; this study had the opportunity to observe the perceptions and attitudes of anonymous online peer assessment strategy of students of different cultural and socio-economic backgrounds from the South Pacific.

A. Learning Management System

By definition, LMS is a web based software system used for managing courses with standard steps of administration, documentation, reporting, tracking, and delivery of educational courses [27]. LMS is standard platform for teaching and learning in HEIs that can support face-to-face courses, online courses and a combination of face-to-face and online learning, also known as blended learning [28]. One of the popular LMS used by HEIs, schools and even businesses is the Modular Object-Oriented Dynamic Learning Environment (Moodle) [27]. Emerging features such as peer assessment strategy through Moodle Workshop tool can be used to administer online peer assessment activities [29] [30] [31] [32] [33] [34].

B. Online Peer Assessment

According to literature, peer assessment has been defined as a pedagogical plan that enables students to have self- paced learning, identify their own strengths and weaknesses, target areas of remediation and develop meta- cognitive skills [14] [35]. For the purpose of this research, we will use the definitions stipulated in [13] with appropriate modifications. Peer-assessment definition in this study: students’ grade and give feedback about the work of their peers against particular criteria provided by the course lecturer.

Furthermore, a study on peer assessment carried out by [36] found that peer assessment increased transparency of the process of peer marking and as a consequence student confidence also increased. The study also noted that students’ awareness and use of marking criteria increased. However, researchers suggested that emphasis be placed on the importance of systematic training academic staff and students undertaking peer assessment. The study did not involve online peer assessment but traditional peer assessment strategy where careful planning and staff involvement was needed. This study however focuses on online peer assessment using Moodle workshop tool, where students were trained to first assess their peers work online. Final peer grading was done anonymously where the assessor and assessee identify was anonymous. A followup survey on perceptions and attitudes towards peer assessment [32] [37] [38] [29].
Researchers from [31] compared teacher and peer assessment of third-year undergraduate students from English discipline university students’ compositions. The study focused on investigating possible friendship bias in peer assessment and its effects on learners’ attitudes towards it. The findings revealed there was no significant difference between the learners’ peer assessment and teacher assessment. However, no friendship bias was found in peer assessment, but this practise led to the change of students’ attitude towards a positive perception on peer assessment. Therefore, the need for a more comprehensive study on freshmen attitude and perception towards peer assessment is recommended. Investigation in the generic courses offered by universities is a good place to start since these cater a broader range and diversity of participants who come from different disciplines and study programs.

Peer assessment seems to be a feasible solution, as a form of formative assessment for large classes. A study carried out by [39], reported the use of the LMS Moodle Workshop module to study the effectiveness of using peer assessment strategy as a formative assessment of students’ individual work in a first-year introductory macro-economics class of over 800 students. The findings outlined the practical challenges related with paper-based peer assessment and provided a range of additional options for enhancing validity and reliability of peer assessment that would not be possible with paper-based systems. However, the research only focused on first year students from one discipline, to capture students’ perceptions and attitudes of students from wide range of disciplines becomes difficult as many courses needs to implement peer assessment in their courses through LMS Moodle Workshop tool. The course lecturers sometimes are reluctant to include peer assessment in their courses as a form of online formative assessment due to their trust and confidence in peer marking process [40]. This validates the choice of course for this research – a generic course titled “UU100 - Communication and Information Literacy” which has students who are admitted to various programme of study as shown in Table I. It becomes easy to capture a broad range of first year students’ responses by just implementing peer assessment in one course.

C. Perception and Attitude towards Peer Assessment

Studies by researchers have investigated on attitudes and perceptions towards peer assessment, perceived fairness of peer assessment, perceptions of learning activity and assessor assessment [9], [38], [29], [10], [33], [41], [32].

A considerable number of studies focused on the effect of anonymity on perceptions and attitudes towards peer assessment [9], [38], [29], [10], [33], [41], [32] . Their findings reported that there is positive effect when perceptions and attitudes are measured on learning activity. In contrast, there is negative effect on interpersonal characteristics such as perceptions on fairness, assessor, psychological safety and fear of disapproval when anonymity is used. From these findings, new opportunities open up for further study on effect of anonymity on perceptions on adequacy of training, fairness of peers’ marks and attitude towards anonymous online peer assessment. Also highlighted in empirical results from [11], there is no study found from PICs in this area. The World Bank report [42] has classified PICs as developing countries because they lack proper infrastructure and have lower living standards, where each country has its own priorities. It is important for all regional countries as a shared commitment of Pacific region to produce 21st Century learners and research on technological solutions to create a student-centered environment for these learners, which is also in line with the Sustainable Development Goals.

III. METHOD

This study considers a descriptive research design using a quantitative survey as a post-intervention study on students’ perceptions and attitudes on anonymous online peer assessment in a blended higher education learning environment. The study was carried out after the occurrence of an online peer assessment and only outlines the results of survey on perceptions and attitudes of students towards the anonymous online peer assessment. To the best of the authors’ knowledge, there is no study carried out on peer assessment from the PICs, as such this study will contribute to the literature on peer assessment studies from PICs. As developed regions like Europe, Asia and South America is more researched that developing countries, this study can also provide a source for comparisons.

A. Settings

The first-year generic course chosen from USP for this study is Communication and Information literacy course (UU100). It is a semester based 14-week course offered in online mode for regional campus students and blended mode for full time students and online mode for working students from main Laucala campus. The main aim of this generic course is to ensure that all incoming students develop knowledge and competence in the use of computers and information researching skills. Furthermore, the second component of the course is designed to address the broader imperative for students to develop their capacity to locate, access, evaluate and use information efficiently and effectively [43]. Two weekly topics were selected for the online peer assessment task. The first topic 1 was on procedural knowledge; mainly students were tested on Microsoft Word skills. The second topic 2 required students to complete a task on information literacy skills. The task required students to critically analyze one website and provide their recommendations and whether they will use the information from the website in their research assignment. UU100 course has no final exam and comprises of a number of assessments including weekly topic assessments, online quizzes, assignments and e-portfolio activities, the majority of which have to be submitted online through the assignment and forum drop boxes in LMS - Moodle. The drop boxes are configured with Turnitin plagiarism detection service, for which USP has subscription [44].

B. Instrument

The instrument in this study was an online survey questionnaire consisting of four sections. Starting with demographic information, followed by perceptions on adequacy of support and training provided before engaging in online peer assessment using LMS - Moodle workshop tool.
and perceptions on validity and fairness of peers marking. The final section was on students’ attitude towards peer assessment strategy.

C. Pilot and Instrument Refinement

The questionnaire content and construct validation were done by three expert reviewers consisting of senior lecturer, associate professor and professor from linguistic, e-learning, distance learning fields respectively. Their feedbacks used to adjust the questionnaire. Sample for pilot testing was taken from main campus where a sample of 39 students voluntarily participated in pilot testing, access to print copy questionnaire was only given to students who voluntarily agreed to participate. Using SPSS 21, Cronbach’s alpha was 0.816 of 16 items. According to [45] rule of thumb, Cronbach’s alpha 0.816 falls under good classification and final survey questionnaire was administered through Google forms.

Students who participated in both peer assessment activities were only allowed to participate in the survey on voluntary basis for a period of four weeks. The survey was opened in week 12 of semester and closed in week 15. Major advantage of using Google forms survey module was that Google hosts student’s emails through Gmail, thus it becomes easy for students to access the questionnaire from any device.

D. Participants

Participants for the study were students enrolled in UU100 course at USP. The final questionnaire was completed by 846 participants out of 1160, representing a 73% response rate. Demographic distribution by gender, age group and study mode for the semester is shown in Fig 2.

The following variables were used for the initial study:
- Due to limited study on anonymity with bidirectional type [33], the online peer assessment task was kept anonymous and privacy of peer reviewers was maintained [29] [38] [30].
- Marking guide in textual and video with e-rubic on LMS was provided and students were trained. Before engaging into actual marking, sample assessments were uploaded on LMS- Moodle workshop tool for students to practice marking [29] [38] [30].

F. Variables and setting of current study on perceptions and attitudes

The study is focusing on perception and attitude of students after engaging in anonymous online peer assessment using the online workshop tool from LMS- Moodle. Therefore, the study is aimed to capture student perception on the adequacy of support and training provided and validity and fairness of peer marking. Then the results of perception are compared with students’ overall attitude towards online peer assessment. As such, the control variables; difficulty of task was same for both online and blended mode of study and the level of support for both modes was similar. The blended mode students were required to attend mandatory face-to-face tutorials, whereas for online mode students support was provided in the form of non-compulsory face to face support sessions at their respective campus of study as shown in Fig 3.

Online support with technological tools such as video conferencing, virtual classroom via LMS and LMS discussion forums was provided to students from both blended and online modes of study. Both online and blended mode UU100 course was managed using single course page with appropriate restrictions such as grouping to control access levels for both mode of study. Moreover, in both modes assessors and assessee were kept anonymous and students from online and blended mode were combined and randomly assigned five assessments to grade.

Motivated from empirical study by [11], the independent variables of this study on perception and attitude were:

[19] and perceptions on validity and fairness of peers marking. The final section was on students’ attitude towards peer assessment strategy.

C. Pilot and Instrument Refinement

The questionnaire content and construct validation were done by three expert reviewers consisting of senior lecturer, associate professor and professor from linguistic, e-learning, distance learning fields respectively. Their feedbacks used to adjust the questionnaire. Sample for pilot testing was taken from main campus where a sample of 39 students voluntarily participated in pilot testing, access to print copy questionnaire was only given to students who voluntarily agreed to participate. Using SPSS 21, Cronbach’s alpha was 0.816 of 16 items. According to [45] rule of thumb, Cronbach’s alpha 0.816 falls under good classification and final survey questionnaire was administered through Google forms.

Students who participated in both peer assessment activities were only allowed to participate in the survey on voluntary basis for a period of four weeks. The survey was opened in week 12 of semester and closed in week 15. Major advantage of using Google forms survey module was that Google hosts student’s emails through Gmail, thus it becomes easy for students to access the questionnaire from any device.

D. Participants

Participants for the study were students enrolled in UU100 course at USP. The final questionnaire was completed by 846 participants out of 1160, representing a 73% response rate. Demographic distribution by gender, age group and study mode for the semester is shown in Fig 2.

The following variables were used for the initial study:
- Due to limited study on anonymity with bidirectional type [33], the online peer assessment task was kept anonymous and privacy of peer reviewers was maintained [29] [38] [30].
- Marking guide in textual and video with e-rubic on LMS was provided and students were trained. Before engaging into actual marking, sample assessments were uploaded on LMS- Moodle workshop tool for students to practice marking [29] [38] [30].

F. Variables and setting of current study on perceptions and attitudes

The study is focusing on perception and attitude of students after engaging in anonymous online peer assessment using the online workshop tool from LMS- Moodle. Therefore, the study is aimed to capture student perception on the adequacy of support and training provided and validity and fairness of peer marking. Then the results of perception are compared with students’ overall attitude towards online peer assessment. As such, the control variables; difficulty of task was same for both online and blended mode of study and the level of support for both modes was similar. The blended mode students were required to attend mandatory face-to-face tutorials, whereas for online mode students support was provided in the form of non-compulsory face to face support sessions at their respective campus of study as shown in Fig 3.

Online support with technological tools such as video conferencing, virtual classroom via LMS and LMS discussion forums was provided to students from both blended and online modes of study. Both online and blended mode UU100 course was managed using single course page with appropriate restrictions such as grouping to control access levels for both mode of study. Moreover, in both modes assessors and assessee were kept anonymous and students from online and blended mode were combined and randomly assigned five assessments to grade.

Motivated from empirical study by [11], the independent variables of this study on perception and attitude were:
gender, educational level, study type and prior experience of peer assessment, bidirectional anonymity whereas dependent variables are perceptions on the adequacy of support and training provided, validity and fairness of peer marking, and attitude towards the online peer assessment.

G. Common method bias
To test for survey response bias, Harman’s single factor test was carried out [46]. There was no significant common bias found in the survey data. The single factor of 35.12% was maximum co-variance represented, which is less than 50% representing that common bias is not a likely issue in this study.

### Table I. Demographic Distribution of Sample

<table>
<thead>
<tr>
<th>Education Level</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed Year 13 Certificate</td>
<td>289</td>
<td>34.2%</td>
</tr>
<tr>
<td>Completed Foundation Certificate USP</td>
<td>190</td>
<td>22.5%</td>
</tr>
<tr>
<td>Completed Certificate level at USP</td>
<td>35</td>
<td>4.1%</td>
</tr>
<tr>
<td>Completed Diploma level at USP</td>
<td>37</td>
<td>4.4%</td>
</tr>
<tr>
<td>Other</td>
<td>295</td>
<td>34.9%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Study Type</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Time Studies</td>
<td>705</td>
<td>83.3%</td>
</tr>
<tr>
<td>Part-time (working student)</td>
<td>112</td>
<td>13.2%</td>
</tr>
<tr>
<td>Part-time (not working student)</td>
<td>29</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Programme of Study</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts (BA)</td>
<td>140</td>
<td>16.5%</td>
</tr>
<tr>
<td>Bachelor of Commerce (Bcom)</td>
<td>341</td>
<td>40.3%</td>
</tr>
<tr>
<td>Bachelor of Education</td>
<td>55</td>
<td>6.5%</td>
</tr>
<tr>
<td>Bachelor of Laws</td>
<td>92</td>
<td>10.9%</td>
</tr>
<tr>
<td>Bachelor of Science (BSC)</td>
<td>113</td>
<td>13.4%</td>
</tr>
<tr>
<td>Diploma</td>
<td>12</td>
<td>1.4%</td>
</tr>
<tr>
<td>Unclassified Undergraduate programme</td>
<td>70</td>
<td>8.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graded Online Peers work Before</th>
<th>N</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>237</td>
<td>28.0%</td>
</tr>
<tr>
<td>No</td>
<td>607</td>
<td>72.0%</td>
</tr>
</tbody>
</table>

IV. RESULTS & DISCUSSION

Participant demographics are presented in Fig 2, Fig 3 and Table I. Fig 2 outlines the demographic profiles of participants. From the data collected, there are more female participants with 65% while male comprising of 35%. The participants from the age group 18-24 years was the largest with 82.6%, followed by 25-34 years (9.9%), 35-44 years (5.9%), 45-54 years (1.3%) and 55+ with (0.2%). Majority of the participants were from blended mode with (62.4%) and online mode with (37.6%). Fig 3 shows the breakdown of students campus of study, a significant number (62.4%) was from main Laucala campus from Fiji. Followed by 11.7% from Vanuatu campus and then 9% from Solomon Islands campus.

Table I shows the wider demographics of students’ education level, study type and programme of study. From which, 28% had already engaged in peer assessment, graded peers work before, and 78% were new to online peer assessment. Furthermore, 22.5% students had educational level of foundation certificate.

### Table II. Results on Student Perception and Attitude

<table>
<thead>
<tr>
<th>Constructs, individual items and Cronbach alpha values (N=846, overall alpha = 0.870)</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception on adequacy of support and training provided (alpha = 0.84)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I found video and user guide instructions useful in grading my peers’ work.</td>
<td>4.37</td>
<td>0.74</td>
</tr>
<tr>
<td>I referred to the peer assessment training instructions and rubric when commenting on and grading my peers’ assessment.</td>
<td>4.26</td>
<td>0.77</td>
</tr>
<tr>
<td>For each of the two assessments (i.e. Topic 3 and 10), I found grading the samples useful before engaging in actual grading.</td>
<td>4.33</td>
<td>0.75</td>
</tr>
<tr>
<td>For each of the two assessments (i.e. Topic 3 and 10), I followed the guidelines provided during training for commenting on and grading peers’ lab submission.</td>
<td>4.28</td>
<td>0.75</td>
</tr>
<tr>
<td>For each of the two assessments (i.e. Topic 3 and 10), I followed the rubrics for grading peers’ lab submission.</td>
<td>4.27</td>
<td>0.76</td>
</tr>
<tr>
<td>Perceptions on validity and Fairness of Peer Marking (alpha = 0.81)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The marks I got from all peers’ for both assessments respectively was accurate.</td>
<td>3.82</td>
<td>0.74</td>
</tr>
<tr>
<td>Peers’ gave me fair grades for both of my assessment.</td>
<td>3.88</td>
<td>0.74</td>
</tr>
<tr>
<td>Moodle workshop peer assessment tool allocated me a fair final grade.</td>
<td>4.00</td>
<td>0.75</td>
</tr>
<tr>
<td>I felt qualified to give feedback and grade my peers’ assessment for this course.</td>
<td>3.96</td>
<td>0.76</td>
</tr>
<tr>
<td>I think my peers’ were qualified to grade and provide feedback on my assessments.</td>
<td>3.84</td>
<td>0.76</td>
</tr>
<tr>
<td>Attitude towards Peer Assessment strategy (alpha = 0.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I prefer peer assessment strategy over other methods of assessment.</td>
<td>3.61</td>
<td>0.96</td>
</tr>
<tr>
<td>I would like to see other courses also use peer assessment strategy.</td>
<td>3.85</td>
<td>1.00</td>
</tr>
<tr>
<td>I feel that peer assessment gives me a voice in the assessment process.</td>
<td>4.08</td>
<td>0.83</td>
</tr>
<tr>
<td>I find peer assessment strategy to be an alternative learning approach for applying the concepts taught in this course.</td>
<td>4.12</td>
<td>0.76</td>
</tr>
<tr>
<td>I think it is important that I do not know whose work it is that I am marking in peer assessment.</td>
<td>3.99</td>
<td>0.97</td>
</tr>
<tr>
<td>By engaging in self-assessment (i.e. assessing my own work and peers’ work against a predefined solutions rubric), I was able to compare my solution with other peers’ solution and improve my learning.</td>
<td>4.34</td>
<td>0.70</td>
</tr>
</tbody>
</table>

Table II shows descriptive data analysis of students’ perception and attitude towards the online peer assessment. The questionnaire used Likert scale, which was weighted as follows: Strongly Agree= 5, Agree=4; Neutral =3, Disagree= 2, strongly Disagree= 1. Three subscales: perceptions on adequacy of support and training provided, perceptions on validity and fairness of peers marking and attitudes towards
anonymous online peer assessment were extracted and their mean and standard deviation was calculated. The data was reliable with overall alpha = 0.870 of perceptions and attitudes. Each construct reliability was also above the benchmark of 0.70 [45]. Perception on adequacy of support and training provided (alpha = 0.84), perceptions on validity and fairness of peer marking (alpha=0.81), attitudes towards peer assessment strategy (alpha=0.80).

To test the effect of control variables difficulty of task given and level of support provided for online peer assessment activity on students’ overall perceptions and attitudes when an independent variable bidirectional anonymity is used. Further statistical analysis to verify its effects was done by calculating average of each case of perception and attitude. For normality test, a Shapiro-Wilk test was conducted out as shown in Table III. Since p-value = 0.00 <0.05 for both average perception on adequacy of support and training provided, validity and fairness of peer marking and attitude towards peer assessment strategy. It can be concluded that the collected data does not follow normal distribution and reject the null hypothesis. Use non-parametric tests for further analysis.

![Table III. Test for Normality](image)

<table>
<thead>
<tr>
<th>Perception</th>
<th>Shapiro-Wilk Statistic</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attitude</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To verify the effect of control variables perception and attitude. A Mann-Whitney U test was carried out to compare the difference between means of online and blended mode students’ responses shown in Table IV. The hypothesis formulated is as follows:

H0: There is no significance difference in peer assessment perception and peer assessment attitude between online and blended mode of study.

H1: There is significance difference in peer assessment perception and peer assessment attitude between online and blended mode of study.

![Table IV. Test of Control Variables Comparison](image)

<table>
<thead>
<tr>
<th>Perception</th>
<th>Mann-Whitney U</th>
<th>Wilcoxon W</th>
<th>Z</th>
<th>Asymp. Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception</td>
<td>83628.500</td>
<td>134349.500</td>
<td></td>
<td>914</td>
</tr>
<tr>
<td>Attitude</td>
<td>75602.000</td>
<td>215258.000</td>
<td>1.108</td>
<td>2.723</td>
</tr>
</tbody>
</table>

Since p-value = 0.914 > 0.05 for peer assessment perception and p-value = 0.296 > 0.05 for peer assessment attitude, we can conclude by accepting the null hypothesis for perception and attitude. Furthermore, perception and attitude towards peer assessment showed there is no significant difference between online and blended mode. The positive perception and attitude is due to the fact of peer assessment aids: peer assessment guides, training, e-rubric and bidirectional anonymity showed students had perceived training and support provided and validity and fairness of grade was effective. Students’ attitude towards online peer assessment is positive from the fact that two control variables did not pose any negative effect on the overall outcome. In conclusion, the peer assessment setting followed in this study was effective and students’ prefer anonymity in online peer assessment. The result is in line with descriptive analysis.

RQ1. What are effects of anonymity of assessor and assesssee on students’ perception? (RQ1a); adequacy of training and support
For the first subscale - perception on adequacy of support and training provided, the average mean = 4.3 and SD = 0.76, which means students agreed that relevant support and training was provided to them for assessing and providing feedback on the online peer assessment activity in complete anonymous setting. It can be further concluded, that for online peer assessment to work in online and blended modes there is a need for student training and proper creation of marking instructions either as document instruction guide or in video format. The students were required to mark two assessments as part of their training phase before they engaged with the actual peer assessment tasks. The training which took place via the Moodle workshop tool provided the students with relevant skills and knowledge on online peer assessment and should assist them in future to work and perform better in similar activities.

(RQ1b); fairness of peers marking?
For the second subscale- perception on validity and fairness of peers marking, the mean = 3.9 and SD=0.75, which means students agreed that the marks given to them in the anonymous online peer assessment by their peers were valid and fair. A major finding was that students felt qualified to give feedback and grade their peers’ work (M=3.96, SD = 0.76) and also perceived that peers were also qualified to grade and provide feedback on their assessments (M = 3.84, SD=0.76). The students also agreed on final grade given by Moodle workshop was fair (M=4.0, SD=0.75).

RQ2. What are effects of anonymity of assessor and assesssee on students’ attitudes towards online peer assessment strategy?
For the third subscale - attitude towards anonymous online peer assessment strategy, the calculated mean=3.99 and SD=0.87. These indicate that students had a positive attitude towards the online peer assessment strategy. The students were positive towards the online peer assessment since students had a voice in the assessment (M=4.08, SD=0.83), which resulted into higher level of student participation, and also enabled students to learn from their mistakes and from their peers. The students also preferred peer assessment strategy over other forms of online assessment and would like to see other courses using the online peer assessment tool (M=3.61, SD=0.96). By engaging into self-assessment with anonymity of both assessor and assesssee, the students were able to compare their own solution with peers’ solution thus they were able to improve their learning (M=4.34, SD=0.70). Therefore, it can be determined that students have positive and favorable perception towards anonymous online peer assessment strategy and would like to see peer assessment used in other online and blended courses. Students also pointed out that anonymity in peer assessment is important with mean= 3.99 and SD=0.97, as anonymity allows students to be more critical and not fear any retaliation and
therefore, they might be more willing to point out weaknesses.

V. CONCLUSION

This paper presents findings from a secondary research on students’ perception and attitude towards the anonymous online peer assessment strategy in an undergraduate course offered through blended and online modes. According to the findings, the students perceived that the training received on online peer assessment was adequate and useful, and the feedback given to the peers was fair and it will enable them to improve their skills for life-long learning. In addition, the feedback received by the students enabled them to improve their skills and better understand concepts, and since the students were also able to compare their assessment solution with their peers, it also provided a platform to improve their learning. This study is not without limitations, as a comparison of attitudes was not carried out with students who did not participate in both activities of online peer assessment. Independent variables gender, education level, study type and prior experience of peer assessment was not explored in this paper. Despite this limitation, our findings are consistent with [34] [14] [9] [11] [39]. Overall, with all the tests conducted, it can be concluded that the students perceived positive perception and attitude towards the anonymous online peer assessment strategy.

Further study in exploring effects of anonymity and non-anonymity on the quality of peer feedback is crucial and recommended as positive result can lead to similar quality of teachers’ feedback. Further rigorous statistical analysis with variables gender, educational level, study type and prior experience of peer assessment is also recommended. Apart from students’ perception and attitude, qualitative study on exploring academics perception on the use of peer assessment in online and blended learning course is also recommended.

ACKNOWLEDGMENT

The authors would like to thank The University of the South Pacific, Center for Flexible learning for funding the project, expert reviewers for survey questionnaire and all participants, including teaching staff and research assistants, who have contributed in this research project.

REFERENCES


