EVALUATING THE USE OF PEER GROUPS IN ASSESSING LEARNING IN NEW TECHNOLOGY

Submitted by
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Declaration of Originality

I, Juliana Mobley Harmeling, declare that this project is my own work and to the best of my knowledge does not contain material previously published or written by any other person. This thesis has not been submitted in any form for another degree or diploma at any other tertiary education institution. Ideas, quotations and other material that has been derived from the published and unpublished work of others have been acknowledged in the text and reference list.

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Abstract

Most teachers struggle to give significant feedback on student assessments due to time constraints. With new technology like iPads becoming 1:1 in the classroom the need for assessment of student-centred learning of these new technologies has added to the teacher’s workload. This Action Research project conducted on a class of 29 Year 9 students in a private school located in the suburbs of Sydney looked at what strategies could be employed that would enable these students to conduct effective peer assessment in providing quality feedback to each other on the use of new iPad technologies. The Action Research method incorporated two cycles. The first cycle involved an individual assignment and an individual peer assessment. The second cycle involved a group assignment and group peer assessment. The group peer assessment had the added factor of individual group members assessing the ability of each other to work well in a group. The assignment given to students was to write a tutorial for another student which would teach their fellow student how to use an iPad application. Data was collected via entire class surveys along with a small number of one-on-one student interviews. The key findings and observations demonstrated that the group assignment and peer assessment was regarded fairer by students than the individual assessment by an individual peer. In addition, the group assessment method was more likely to increase student knowledge with the learning of new technologies.
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Chapter 1: Introduction

1.1 Background to Study
For several years this teacher/researcher has taught a course called Learning For Life to every year 9 and 10 student at a private school in the western suburbs of Sydney, Australia. One of the objectives of this course is to assist the effective implementation of iPad technology. A challenge which most teachers encounter is how, in a time-poor environment, to effectively give feedback to each student for their assessment tasks. This course is particularly challenging as the teacher has ten different classes with a total of over 230 students each week, but only one fifty minute period of face-to-face teaching time.

This school has implemented an iPad 1:1 program in 2014. As a result students and staff have been on a ‘steep learning curve’ to acquire the necessary skills for effective uses of applications (apps) such as iMovie, Upad, Garageband, Qrafter, Mindomo, Book Creator, Keynote, and Pages. Accessing Google Drive and Moodle from the iPad and obtaining the information in the format/app which will best be used in a particular classroom setting has also been a challenge. By enabling groups of students to construct useful ‘How-to’ documents/presentations and share the information with each other, has provided the benefit of increased knowledge and a ‘quick reference’ manual to assist students and staff on iPad technologies with which they are currently unfamiliar.

1.2 Purpose of the Study
The purpose of this study is to evaluate peer assessment in the context of implementing strategies with students which encourage self discovery in new technologies, particularly the iPad. The main focus of this research entailed the students conducting peer assessments on implementing new iPad technologies both as individuals and in a group through giving constructive written feedback.

1.3 Statement of the Problem and Research Question
1.3.1 Statement of the Problem
In using peer assessment of learning new iPad technologies in the 1:1 iPad mobile teaching device environment it is important for teachers to know what strategies are effective in enabling students to provide quality feedback to their peers.

1.3.2 The research question for this study
What strategies enable Year 9 students to conduct effective peer assessment in providing quality feedback to each other on the use of new iPad technologies?
1.4 Benefits of the Study
Benefits of this study include increased knowledge of common school iPad applications for students and a quick reference manual which will also be made available to staff. Students will also benefit from practising critical thinking skills by analysing and making decisions related to marking and giving feedback to their fellow students. Lower level students will gain increased knowledge from seeing the example of a more advanced student’s standard of work. Due to the students’ marking each other they will profit from an increased level of specific and detailed feedback while the teacher’s stress load will be reduced in meeting school report deadlines. Other teachers can also benefit from this study by looking at the strategies learned from the individual and group peer assessments. As students gain confidence in the iPad applications used in this assessment, the school overall will benefit from the students’ increased technical knowledge as this will translate into their other courses. This study will be of assistance to other schools in implementing new technology and methods of student assessment and self discovery in learning.

1.5 Outline of the Thesis
This chapter provides an introduction and background to the research topic of investigating peer assessment as it relates to learning new iPad technologies. Chapter Two consists of a literature review investigating peer assessment and methods of learning new iPad technologies. Chapter Three outlines the research methodology undertaken in this study. It describes information about the participants, the processes and the instruments utilised in this study. Chapter Four describes and analyses the results in the data gathered from the instruments with respect to the research questions. This Chapter also discusses the results with respect to the literature. Chapter Five provides the conclusion, highlighting the pertinent findings, the limitations of this study and future research recommendations.
Chapter 2: Literature Review

This literature review explores some best practices for peer assessment and the use of mobile technology (1:1 device) in the classroom for student-centred learning. This review is in two main sections, peer assessment and mobile tablet classroom usage. In particular, the Apple iPad as a mobile learning device is considered. There appears to be a lack of articles in the literature about peer assessment as it relates to new technologies such as the iPad.

2.1 Peer assessment
According to Topping (1998) peer assessment refers to any arrangement in which students consider the amount, level, value, worth, quality or success of the learning outcomes of their peers. One of the common criticisms for peer assessment is the reliability and validity of students assessing each other compared to the expert assessing of the teacher.

McConlogue (2012) in examining the fairness of peer assessment particularly in the area of complex written work found that complex writing assignments with open-ended responses were difficult for peer assessment as the students struggled to understand the marking. Since the students did not feel that they fully understood the marking they felt the assessment marking was inconsistent from student to student. Students in her study had a greater perceived fairness with a ‘closed’ question or factual type of assignment.

Since validity of peer assessment can be a concern Bouzidi and Jaillet (2009) conducted a large (242 students) experiment to test peer assessment against the professor’s assessment. Their results showed that peer assessment was equivalent to the professor’s assessment in the case of a ‘closed’ question or factual type of required response. Tseng and Tsai (2007) also showed that in a high school computer course of 184 students that peer assessment could be considered a valid method of assessment. The key for the reliability and validity in both of these studies was appropriate scaffolding with clear marking instructions. The quality of the marking criteria is also important for helping to ensure reliability of peer assessments (Bouzidi, 2009, p.266).

While decreasing the marking workload of the teacher is the initial perceived benefit of peer assessment, Mok (2010) discusses how peer assessment can also enhance student learning if sensitively implemented. In Mok’s article the students were unfamiliar with this kind of assessment prior to her study. This paper discusses students’ perceptions of the implementation of peer assessment and gives some excellent advice for other teachers considering this method of assessment. One strategy was to assign identities to students so that their names are not on the evaluation sheet (Mok, 2010, p.233). Another suggestion
which is similar to previously discussed research was the use of a standard form for assessment. A reference sample should also be given ahead of the marking time showing the students what is a good assessment (Mok, 2010, p.233). Making part of the student’s final mark dependent on the quality and accuracy of the feedback they provide to their fellow students could also be a good incentive for unbiased and fair peer evaluations (Myers, 2014, p.3).

Mok also discusses that while the students’ in her observed study were neither prepared psychologically nor methodologically, true successful implementation of peer assessment requires students to understand the reason for peer assessment and how to use the appropriate forms ahead of time (Mok, 2010, p.234). This will help the students feel capable of assessing their fellow students and that they know enough to do so (Mok, 2010, p.236). Dickson and Carver (1980) also stress that psychological preparation for the students was essential. This preparation should aim to help learners make the psychological leap from being dependent on the teacher to being independent, to “build up their self-confidence in their ability to work independently of a teacher.” (Mok, 2010, p.236). In Holec (1981), this ‘deconditioning process’ was considered essential yet gradual. A genuine concern in the area of capability is for English as a Second Language (ESL) and low literacy students and their real and perceived abilities to assess their peers to the provided form correctly. Since the students’ confidence is critical in the peer assessment process one manner to assist the increase of student confidence would be the use of a form or marking rubric which the student uses to assess (Mok, 2010, p.236). Mok used a simple form which criteria consisted of three faces as the “assessment marks.” (Mok, 2010, p.234). In her study the students desired a place for suggestions not just the three faces (good – smiley face, neutral – face with a line, and frown - for not good). The students desired more choices than just three for their marking (Mok, 2010, p.234) possibly so that they could appropriately distinguish between excellent and good work.

Another recommendation for teachers conducting a formal peer assessment was to have a group of students assess another group of students (Mok, 2010, p.233). By not including their names on the assessment form and the blending of individuals into the group would seem to decrease the risk of individual vilification or harassment. Interestingly, Kao (2013) examines the aspect of individual group member interactions and the reduction of “free riding” within a group. Kao found that peer assessment could enhance group project interactions. Members within a group were to assess if their group members were freeloading or being too dominant. This method encouraged a more balanced collaborative learning experience and strived to decrease the unequal participation of members within the
group (Kao, 2013, p.112-114). Myers (2014) recommends that the criteria for internal group member assessment (members of one group assessing the other members of their group) should be the quality of work, body of work and participation of each team member.

Dickson and Carver (1980) state that the primary reason for peer assessment is for students to improve their own performance. Mok (2010) affirms this reason in that her students’ ability to see their own issues as well as their thinking process about the subject improved as they observed their peers (Mok, 2010, p.236). Mok observed that peer assessment can help in prompting future actions for students as it makes them think especially in any area they may have commented on their peers (Mok, 2010, p.236). Goodrich (2000) found that students who apply rubrics to the assignments of their peers are more reflective and attentive in applying them to their own assignments. Thus, peer assessment is both a learning tool and an assessment tool (Lu & Zhang, 2012).

2.2 iPad usage in the classroom

Rossing, Miller, and Cecil (2012) states that “new technologies develop rapidly; the pace only appears to be quickening.” Considering this, educators using the iPads in the classroom must be diligent and committed to learning this new technology and working through the steep learning curve associated with using it (Rossing, et al, 2012, p.18). In addition, students too will need to be diligent in learning the new technology.

The first Apple iPad was released to the market in March of 2010. Brown-Martin (2010) in his paper appropriately titled “iPad – a game changer for learning?” discusses how the iPad is seen by many as the tool which may change learning towards a more constructivist learning practices with students having a larger degree of control over their work. He talks about how the student could decide on where, when and how to do their work with a mobile device such as the Apple iPad. Culen and Gasparini (2012) conducted their study using the first generation iPads. The teachers in this study struggled with connection of the iPad to their Smart boards. While the students had a favourable experience with the iPad while creating a newsletter, the general consensus of the teachers was output achieved with the iPads was inferior to what they usually obtained using traditional teaching methods (Culen and Gasparini, 2012, p.256). This could possibly be overcome if the same study was conductive again with the use of second generation or beyond iPads and Apple TV (instead of a smart board). Interestingly, Culen and Gasparini stated that they did not have any final conclusions to their question - “When is a student-centered technology, supported learning a success?” (Culen and Gasparini, 2012, p.268). They felt their sample size was too small to draw a definite conclusion about the paradigm changing potential of the iPad and that the
teachers silently marginalised the use of the iPad after their initial trial (Culen and Gasparini, 2012, p.268).

Culen and Gasparini noted that the iPad was not originally designed for the classroom (Culen and Gasparini, 2012, p.257). But, as media attention focussed on its possibilities in the classroom, Apple started to introduce such services as iTunes U, iBookstore, iBook Author publishing tool (Culen and Gasparini, 2012, p.257) which are a great resource of learning both for teachers and students.

2.3 Conclusion
In conclusion, as the education environment is changing rapidly, iPads can be compelling additions to the teaching process and can assist teachers in keeping content fresh, entertaining and engaging for students. However, teachers need to understand more than just the basics of tablet technologies and so do the students. The iPad has greater potential in the classroom than just as a game revision tool (Johnson, 2011) In addition, as outlined in the review above peer assessment has potential to develop students’ thinking and their own performance. Therefore this research study examined strategies for assisting groups of year 9 students in peer assessment and the construction of documents which could be used to teach, other students and staff, various iPad technologies.
Chapter 3: Methodology

3.1 Research Design

Action Research was the methodology of this research project. The main purpose of Action Research is to help teachers improve their classroom practices by focussing on an issue or problem in their classroom and working towards improvement on the particular issue. Action Research involves four main steps which are: Planning, Acting, Observing and Reflecting (NSW DET, 2010). Action Research is different from other kinds of research methods in that it is cyclical in nature.

![Action Research Spiral](image)

Figure 3.1 Action Research Spiral (Kemmis & McTaggart, 2000)
During this action research project the researcher evaluated strategies which encourage effective peer assessment. Two cycles of approximately four weeks each were conducted. The first cycle researched students being individually assessed by their peers and the second cycle researched peer assessment using group assessment.

The Planning for the first cycle involved the teacher preparing the assessment task and the marking criteria for the students. During the Action phase students were given the assessment task together with the marking criteria and allowed two weeks to complete the task. The required task for the students was to present a document or other presentation (i.e. Keynote or Explain Everything) which showed someone else in a step-by-step manner how to use one aspect of the iPad technologies from the school’s required list of applications. The presentations were handed/emailed first to the teacher and then to other students (with the original student’s name undisclosed) for evaluation and assessment. Students were to follow the marking criteria given by the teacher and assess one other student’s work.

The Observation phase involved observing the students assessing each other and reading through the assessment sheets and surveys. The Reflection phase of the Action Research occurred with the researcher’s evaluation/reflection of the students’ assessments, surveys and observed behaviours. The second cycle involved similar steps to the first cycle but rather than individual assessment the second cycle focussed on group assessment. An appeal process was implemented for the occasion that a student felt the mark they received is unfair either in the individual assessment or in the group ‘working together’ assessment. The names of the individual group team members were deleted before the sheets where handed back to the individual team members.

3.2 Research Participants
The population involved students from a private Christian school in the northern suburbs of Sydney. The sample for this research was one Year 9 Learning For Life class which consisted of 29 students - 13 females and 16 males. Of the 29 students, seven students (four males, three females) were interviewed about the views and opinions on both the individual and group processes of learning and peer assessing. The researcher used her Learning For Life classes during this Action Research project to evaluate how students can best self learn new technologies and successfully assess each other.
3.3 Research Instruments
The instruments were developed to be understood by Year 9 students so the Likert scale was kept simple with only three choices. The advice provided by Mok (2011) relating to peer assessment was drawn upon in developing the instruments. In addition, the research of McConlogue (2012) as related to fairness in the construction of the assignment and marking criteria. Kao (2013) and Myers (2014) advice was also helpful with the group method of peer assessment and the development of the instruments related to Cycle Two.

3.3.1 Individual Marking Sheet (Cycle One) Appendix A is a simple marking sheet, it contains four multiple choice questions each directly related to the assignment marking criteria. The marking sheet also contains two open-ended questions giving the student marker the opportunity to give feedback on how the person can improve and encouragement for what their peer did well in the assignment. At the foot of the marking sheet the peer marker is asked to circle one of the grade scale letters with the following descriptors: A=excellent, B=above average, C=average, D=needs some improvement but passable, E=major improvement required (no demonstration of understanding).

3.3.2 Individual Peer Assessment Questionnaire (Cycle One) Each student completed a survey of 10 questions to investigate how fair and effective they thought the process of individual peer assessment. Eight questions were based on a simplified Likert-type scale (agree, not sure, disagree). Two questions were open-ended asking about improvements for the peer marking process and if they felt this was a good method of learning new technologies (Appendix B).

3.3.3 Individual Interview Questions (Cycle One) A small group of students were chosen to be interviewed individually about the individual peer assessment process to gain further clarification and understanding. A set of five open-ended questions were used (Appendix C).

3.3.4 Group Marking Sheet (Cycle Two) Each group was to construct a presentation for the new technology in a step-by-step guide on paper and then the groups assessed each others’ documents using a structure very similar to the individual marking sheet. It contains four multiple choice questions each directly related to the assignment marking criteria. The marking sheet also contains two open-ended questions giving the student markers the opportunity to give feedback on how the group can improve and encouragement for what their peers did well in the assignment. At the foot of the marking sheet the peer markers are asked to circle one of the grade scale letters with the following descriptors: A=excellent, B=above average, C=average, D=needs some improvement but passable, E=major improvement required (no demonstration of understanding) (Appendix D).
3.3.5 Group Team Skills Marking Sheet (Cycle Two) The teams individually marked the contributions and abilities to work well within a team of each of their fellow members (Appendix E). For example if the group had four members then Student A would fill out this sheet three times, one on Student B, one on Student C and one on Student D. This simple marking sheet contains three multiple choice questions each directly related to the assignment marking criteria of working in a team. The marking sheet also contains two open-ended questions giving the student marker the opportunity to give feedback on how the person can improve and encouragement for what their peer did well in the assignment. At the bottom of the marking sheet the peer marker is asked to circle one of the grade scale letters with the following descriptors: A=excellent, B=above average, C=average, D=needs some improvement but passable, E=major improvement required (not a team player).

3.3.6 Group Self-Assessment Marking Sheet (Cycle Two) This marking sheet includes the same three multiple choice questions from the group team skills marking sheet which relate to the assignment marking criteria about working in a group with other students. However, this time the student is reflecting on how well they feel they met the requirements. The marking sheet also contains two open-ended questions giving the student the opportunity to give feedback to the teacher on this task and how this method could be improved next time as well as what they liked or how they felt they benefited from doing this task. At the foot of the marking sheet the student is asked to circle a grade which reflects how they feel they performed in this task. The grades used were: A=excellent, B=above average, C=average, D=needs some improvement but passable, E=major improvement required (not a team player) (Appendix F).

3.3.7 Group Peer Assessment Questionnaire (Cycle Two) This questionnaire was about the group process. It was identical to the Individual Peer Assessment Questionnaire except the wording was changed to reflect the group peer assessment and an additional question was added asking the student which type of task they preferred (individual or group) and why they preferred that method (Appendix G).

3.3.8 Group Interview Questions (Cycle Two) The same small group of students interviewed after the individual task were interviewed again individually about the group peer assessment process to gain further clarification and understanding. A set of five open-ended questions were used which were similar to the ones used in the Individual Interview questions in Cycle one. (See Appendix H for sample interview questions).

3.4 Analysing the Data
From the marking sheets for the individual and group (Appendix A, D, E and F), the common grade scale letter will be recorded and given a numerical value (A = 5, A- =4.75, B+ = 4.25,
The mark an individual student received on the individual task was solely based on the mark from their peer on their marking sheet (bottom of Appendix A). The mark an individual student received for the group task was calculated as follows was based on the research of Kao (2013):

\[
\text{Total Score} = (\text{Assignment Score})(W_1) + (\text{Self + Group Members Score})(W_2)
\]

The assignment score is the mark which the overall group received for their project, all students within one group would have the same mark for this score (Kao, 2013, p. 115). \(W_1\) and \(W_2\) are the proportional weightings given to each score for the purposes of this study the weights were equal at 50% each. The Self score is the mark they gave themselves for the quality of work they produced as well as the team member skills they felt they displayed to the group (see Appendix F). The Group Members score was the average of the marks a student received from their group members again on their quality of work and team member skills (see Appendix E). Once each individual student marks had been calculated to the formula above, these marks were averaged to achieve an average class mark for the group project and group peer assessment. The class average mark from the individual project and individual peer assessment were then compared to each other to see if there was a tendency for greater leniency with one of the methods.

For both the questionnaires (Appendix B and G), simple Likert-scale questions were totalled for each category (example number of students who marked agree for question one) and then compared to each other for student preferences. Since a different number of students completed each the individual and group questionnaires the percentage was calculated based on the number of completed questionnaires for each cycle. For the open-ended questions the students’ comments were listed and then like comments were grouped together. The open-ended questions from the interviews (Appendix C and H) were handled in the same manner.

### 3.5 Validity, Reliability and Triangulation

During the individual process (Cycle one) five students assignments were marked by two different students to check for consistency in the individual peer assessment marking. For the group projects (Cycle two) the teacher also marked the content of each group assignment and compared the group peer assessment (content only) to the teacher’s assessment. Noting the teacher did not assess the students’ team member skills. The students’ answers to the question ‘I believe I received the mark that I deserved’ were also
compared to the mark the student received. This was used to ensure that students’ who received a ‘C’ were as satisfied with the process as the students’ who had received an ‘A’.

In addition to the measures listed above, the questionnaire results were compared to the answers from the student interviews to check for consistency. Thus the questionnaires and interviews provided sources of data. In addition to the data sources, the teacher’s observation of the process also added to the reliability of the data.

3.6 Ethical Considerations

To ensure an ethical approach, the researcher provided documentation of all procedures, surveys and interview questions to the Morling Ethics Committee and received clearance to begin the Action Research. Clearances were also received from the Principal and Vice Principal at the school where the research was conducted prior to beginning. The students were informed that they were the pilot group for these tasks and provided with time in class to work on the assignments for both the individual and group (a small amount of outside class time may have been required by some students to fully complete the tasks). All surveys were conducted during class time. Students were chosen for the interview on a volunteer basis having met the requirement of participating in all aspects of the tasks and research (not absent during class work time or for the presentation and marking days). The students were interviewed on school grounds during lunchtime in the school cafe where they were rewarded for their participation and willingness to sacrifice their lunchtime with an edible treat of their choice.

The students were informed prior to beginning the research that they or their parents could view the completed research upon completion in Term 1 of 2015.

The next chapter gives the results, analysis of the results and a discussion of the results related to the literature.
Chapter 4: Results, Analysis and Discussion

4.1 Introduction
This chapter will present the results and analysis of the results from the Action Research conducted with Year 9 students during eight lessons. The data derived from observations, questionnaires and interviews will be used to answer the research question:

- What strategies enable Year 9 students to conduct effective peer assessment in providing quality feedback to each other on the use of new iPad technologies?

There were two cycles in this Action Research project. Each cycle went for four weeks and overall the research covered a period of ten weeks due to technical difficulties with the school network which caused delays. The researcher developed marking sheets and questionnaires for each cycle. A copy of the marking sheets, questionnaires, and assignment sheets for each cycle are located in Appendix A-J.

4.1.1 Preliminary analysis of students’ knowledge
While no formal analysis was performed to assess the students’ knowledge of various iPad technologies, there was an obvious lack of knowledge due to the fact that a majority of students in the research group did not even have the required school apps installed on their iPads. An informal survey was conducted on peer assessment asking the students if they had participated in such an activity before and approximately 90% said they had not.

4.2 The first cycle
The first cycle consisted of four fifty-minute class periods for the students i.e. one class a week over four weeks. There was an additional lunchtime period of forty minutes for the students who participated in the interview.

4.2.1 Planning
The teacher constructed the assignment which was a tutorial the student had to develop to teach another student how to use one of the sixteen iPad apps that are required at the school (Appendix K). She also developed the marking criteria, the questionnaire and interview questions. In addition she planned the following four lessons: Lesson One introduced the concept of peer assessment and the assignment; in Lesson Two students worked on their own in class developing a tutorial for their chosen iPad app; in Lesson Three the individual peer assessment (Appendix A) was conducted; and in Lesson Four, the results were given back to the individual students and they completed the questionnaire (Appendix B) on the process.
4.2.2 Action
In Lesson One, students were given an assessment task (see Appendix I) with the instructions to develop a digital “document” for the iPad which another student can use to understand how to operate a particular iPad app. They were to create a tutorial for at least one aspect of the app they chose. The assignment was anticipated to take between 1-2 hours to complete and they were given the rest of the fifty minute period in which the assessment task notice was given and reviewed with them by the teacher. They were also notified they would be given an additional fifty minute period the next week (Lesson Two) to work on this assignment in class although some work may be required at home to complete the assignment. At the same time the students received the assignment they also were informed that their mark be given by one of their peers based on how well the tutorial was constructed to the criteria below:

1. Answers the question “what is the app used for?”
2. Clarity and ease of following the instructions
3. Accuracy of the instructions
4. Presentation of the instructions

The students were given a list of sixteen apps from the school required list of apps (Appendix K) to choose from for their assignment. The students were also given detailed verbal instructions about constructive criticism and how to give it well.

Before Lesson Two students were emailed a number which they were to write on their paper documents instead of their names or were to be included in the filename of any digital files. The presentations were then either emailed to the teacher or handed in via paper (prior to Lesson Three) with their assigned numbers instead of the students’ names. This was to ensure anonymity for the student being marked. In Lesson Three the teacher emailed/handed out the marking sheet and student presentations for the peer assessment. During this aspect of the research several significant technical issues developed with the school’s network, the main one being the students were initially unable to receive any emails from the teacher and were therefore not able to mark on the designated day. Due to these network issues the study was delayed two weeks. Several students had completed their assignment but did not know how to email or digitally send it to anyone else. This became very time consuming for the teacher to instruct each student for their particular digital method how to submit and distribute to the peer assessor maintaining anonymity. In Lesson Four the students received their presentations and peer assessment marking sheets for their in-class review. Once the students had reviewed their results they completed the questionnaire (Appendix B). Seven students were then interviewed individually during lunch.
4.2.3 Observation
The teacher observed the students during the marking of their peers (Appendix A) and when they answered the questionnaire (Appendix B). Seven students (four males and three females) were interviewed about the process (Appendix C).

Upon calculating the results from the student questionnaire (Appendix B) the majority of students were not sure they liked this method of marking. Most students did like the additional feedback they have received and felt they had learned more because of it. Less than half the class thought this marking process was fair and most were not sure they wanted to do this individual type of marking process again. Yet a large majority felt they had received the mark which they deserved. There was not observed correlation to satisfaction with the process and level of mark received. A majority of the students felt they understood what was required of them for marking and believed they had marked their peer fairly.

One point of concern was of the five students who had been double marked, four had received significantly different overall marks (for example the first student gave them an ‘A’, second student gave them a ‘C’).

The average mark for the class from individual peer assessment was 3.8 which is approximately a ‘B-’. When the teacher marked the assignments the average of the individual marks for the class was a full letter grade lower at a ‘C-’ (2.7).

From the consolidated comments from the class questionnaire and the interviews, students felt for them to learn from this type of assignment then the app chosen for review needed to be one they were not already familiar. Also quite a few students commented that they needed more clarity about the task from the beginning, particularly various submission methods. This was the first time they have had an assignment like this one and struggled to understand expectations initially. Quite a few students believed the process could be improved and made more ‘fair’ by having multiple students mark each assignment.

4.2.4 Reflection
Based on the comments from the students, the teacher made several changes for Cycle Two.

1. Students to print four identical copies of their app tutorial in addition to sending it electronically. An additional benefit of having a paper copy would allow the assessing student the ability to read the tutorial and work on the new app at the same time without having to ‘flip back and forth’ digitally. The reason for this was that in Cycle One there were significant technical difficulties with the digital
submission of the student's work, which delayed the completion of the individual marking process by a couple of weeks.

2. The initial assignment notification sheet was also re-worded to be clearer on the required format for submission for the students.

3. Additional discussion of marking criteria as related to quality levels and the common grade scale was undertaken with students prior to marking day with examples given both verbally and on the whiteboard.

4. In Cycle One, students suggested that each assignment should have multiple students marking it. At least two additional markers looked at each submission in Cycle Two as it was marked by a group.

4.3 Cycle Two
This cycle took four weeks to complete with one lesson per week, additional lunchtime periods were used for the final individual student interviews.

4.3.1 Planning
The teacher assigned students in a random manner to a group creating seven groups consisting of four members each (one of the 29 students was overseas for this portion of the research). The teacher adjusted the individual marking sheet for a group (Appendix D). Marking sheets relating to team member skills and perceived quality of work were also developed for group member to mark each of their fellow group members and themselves (Appendices E and F).

The fifty minute lessons planned for Cycle Two included: In Lesson One, the assignment and marking criteria were to be given to the students and the group peer assessment process explained; in Lesson Two, students would be given the time to work with their groups on the tutorial development; in Lesson Three students would perform the group peer assessment (Appendix D), the Team Skills assessment (Appendix E) and the Self Assessment (Appendix F); and finally in Lesson Four, the students were to complete the group questionnaire (Appendix G).

4.3.2 Action and Observation
In Lesson One, students were placed into random groups and given a group number by the teacher. They were also given the assessment task (Appendix J) with the instructions to develop a tutorial for one of the listed iPad apps. They were to create the tutorial as a team, dividing up the work and setting deadlines as was appropriate to meet the marking criteria (which was the same as for the individual tutorial assignment). The assignment was anticipated to take within 1-2 hours to complete and they were give the rest of the fifty minute period in which the assessment task notice was given and reviewed with them by the
They were also notified they would be given an additional fifty minute period (Lesson Two) the next week to work on this assignment with their assigned group in class although some work may be required at home to complete the assignment. At the same time the students received the assignment they also were told that their mark would be formed both from the quality of work their group produced as judged by another group and by one of their own group members views of their team member skills as showed below:

Group assignment score
1. Answers the question “what is the app used for?”
2. Clarity and ease of following the instructions
3. Accuracy of the instructions
4. Presentation of the instructions

Team member skills score
5. Ease of ability to work with others
6. Accuracy and quality of work provided by the individual to the group
7. Timeliness of the individual student’s work to the internal group deadlines

The students were given a list of sixteen apps from the school required list of apps to choose from for their assignment. This list of apps (Appendix K) was the same one used during Cycle One. Each group had to choose a different application for which to write their tutorial. In Lesson One, the students were also given detailed verbal instructions about how to work well within a group of people and about division of work. They were reminded of these instructions during Lesson Two.

In Cycle Two, students were required to print four identical copies of their group’s app tutorial in addition to sending it electronically for Lesson Three. As one group of students was assess another groups’ work anonymity of the individual was built into the process. Six of the seven groups brought the correct paper copies, one group only submitted the digital copy but the network was fully function and the only digital groups successfully disturbed their work to the assessing group.

4.3.3 Reflection
Based on the comments from the students, the teacher will consider the following in the future:

1. Requiring students to print 4 identical copies of their app tutorial in addition to sending it electronically was an excellent back up plan for possible technological breakdowns. An additional benefit of having a paper copy allowed the assessing student the ability to read the tutorial and work on the new app at the same time without having to ‘flip back and forth’ digitally. Most students liked marking the paper
copy more than a digital copy but wanted the digital copy for their own reference in the future.

2. The change in Cycle Two to a more clearly worded assignment notification sheet for digital submission only allowing the use of one platform (in this case Google Docs) required less individual coaching by the teacher for each students’ digital submission.

3. Verbal instructions even with given whiteboard examples was still not sufficient information for Year 9 students to be confident in their peer assessments even within a group environment. A full page of examples, one example for each Common Grade Scale mark should be given. This is necessary for each question which the student group is being asked to mark.

4.4 Analysis and comparison of results for individual and group peer assessment

A total of 23 students of the 29 completed both cycles in this research. Eighteen students completed the Individual Peer Assessment Questionnaire and 25 completed the group one. The numerical data from the questionnaire was compared with the written comments as well as the interview answers to check for reliability and validity. Table 4.1 shows the responses to each of the questions on the Individual Assessment and Peer Assessment questionnaires.

<table>
<thead>
<tr>
<th>Table 4.1 Peer Assessment Questionnaire Summation (percentage)</th>
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<td></td>
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<tr>
<td>Agree</td>
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<tr>
<td>Indiv.</td>
</tr>
<tr>
<td>I liked this method of marking.</td>
</tr>
<tr>
<td>I feel that I learned more due to the feedback which I received.</td>
</tr>
<tr>
<td>I feel this process was fair.</td>
</tr>
<tr>
<td>I believe I received the mark that I deserved.</td>
</tr>
<tr>
<td>I would want to do this process again.</td>
</tr>
<tr>
<td>I not only learned about my assigned iPad technology but also about the person’s which I assessed.</td>
</tr>
<tr>
<td>I believe I gave a fair mark to the person whom I assessed.</td>
</tr>
<tr>
<td>I fully understood what I needed to do to mark this assignment fairly.</td>
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</tbody>
</table>
The students’ tutorials documents were also marked by the teacher for research purposes. Upon the comparison with the individual tutorial documents, the group tutorials were considerably better in quantity and quality of information in the teacher’s opinion. However the average peer assessment class mark showed no difference (both averaged to 3.8) between the perceived qualities of the individual verses group documents to the students. In contrast to the similar marks, six out of the seven students interviewed individually felt they learned more in Cycle Two with the group tutorial than with the individual one and that they enjoyed marking in a group more than as an individual. One student stated “team marking was very good and it gave me more ideas of what I need to do on my assignments.” Their main reasons for preferring the group method were both because they felt their anonymity was more easily maintained and hearing the input from the group members they found to be beneficial. One student commented “the group process was more fair as you had more students marking” but added that he personally liked the ultimate control which he had in the individual tutorial method.

The group method of peer assessment required less interaction by the teacher thereby decreasing workload. This was mainly due to the ease of maintaining anonymity in the group verses with the individual students.

4.5 Discussion
One of the common criticisms of peer assessment is the reliability and validity of students assessing each other compared to the expert assessment by the teacher. The individual assessments in this study were not consistent with the marking of their peers or to the teacher. However the group assessment showed greater consistency and varied only slightly when compared with the teacher’s assessment. Mok (2010) maintains that the reliability of group assessments can be improved by providing a reference sample. A reference sample was provided but was not adequate. A separate sheet of examples for each grade for each question would assist students in marking.

According to McConlogue (2012) students have a greater perceived fairness with a closed or factual type of assignment. Although the assignment in this study was mostly fact-based there was room for additional information. For example, the student either did or did not tell about the app’s purpose and possible uses. Where the students struggled and wanted more information was with very clearly defined examples for each grade option like a detailed rubric. During the interviews and in the survey comments a large majority of students stated they like the open feedback areas for improvement and encouragement comments. They felt these areas contained the most useful information for future improvement. But they also
wanted more choices than the three Likert-type scale choices; most felt that five would be more appropriate as that would correlate to the grade scale.

As Mok (2010) had suggested the identity of the student marker was not shown on the marking sheet which was returned to their peer. Many of the Year 9 students in this research were highly concerned about maintaining anonymity. This was commented on in both the interviews for Cycle One and in the questionnaires. Many students felt their handwriting could be recognised from the marking sheets. This handwriting issue could be solved by having a digital marking sheet which when completed is emailed or printed and turned into the teacher.

When working with new technologies very clear instructions and a consistently reliable process needs to be in place prior to giving the assignment. The study showed the benefit of the student turning in the work digitally and via paper. In this study Google Docs did not meet the necessary requirements as it showed the person’s name that had uploaded the file thereby violating the anonymity of the student being marked. Also email proved to be very time consuming for the teacher in Cycle One as a separate file and email was required for each student. A class folder on a network drive which does not show the name of the person uploading the file may be a better option for accessibility and anonymity than other methods.

Utilising the suggestions of Kao (2013) to encourage a more balanced collaborative learning experience and strive to decrease unequal participation within the group, each group marked their fellow members’ work and team skills. No comments were received from the students either negatively or positively on this aspect of the research. It could be concluded that no negative comments means it was a natural part of the process for the student. Positive team interactions were observed by the teacher, who deduced that since the students were well aware ahead of time that team skills were a part of their mark that excellence in group interactions was encouraged by this aspect of the assignment.

One of the goals of this study was to help students’ learn to self teach with new technologies. The tutorial of a school app appeared to work well as it is commonly understood that a person has genuinely learned a topic when they can teach it to someone else. Comments which were received from students in this area expressed desire for additional apps to choose from on the assignment not just the school required apps. In the future the option could be given to suggest an app not on the approved list but prior approval from the teacher must be gained. Several students commented that they had learned new
tricks with the apps from marking others as well as from their group members. Most of the students who disagreed with the statement “I not only learned about my assigned iPad technology but also about the person’s which I assessed” did so because they already knew the app therefore did not feel they learned anything new.

The group tutorials were of a good quality overall. For the school to receive a benefit from the development of the students’ training materials for using the apps, the students should be given time to make corrections and resubmit after receiving feedback on the task. A common template would be beneficial for consistency and ease of reading the various documents.
Chapter 5: Conclusion – Recommendations arising from the research

In answer to the research question, “What strategies enable Year 9 students to conduct effective peer assessment in providing quality feedback to each other on the use of new iPad technologies?” The group method of assessment was overall more beneficial for learning new technologies. The collaborative effort seemed to result in a higher level of excellence in the product produced by the students when the teacher marked both types of assignments. The synergy of working together as a group meant a greater sharing of knowledge. This made for a more advanced tutorial which was clearer and had already been reviewed by several students (within the group) prior to assessment. The students were also challenged to learn how to work well with a group of people with whom one would not normally choose to work with. Technology is a wonderful educational tool when it works perfectly but highly frustrating and a detriment to learning when it does not. Therefore back-up plans which still allow for the overall outcomes to be met are needed for when technological breakdowns happen.

The recommendations from this study for peer assessment of iPad tutorials with a Year 9 class are as follows:

1. Group peer assessment is used rather than individual peer assessment as a more reliable form of peer assessment.
2. Teachers should provide a page of examples similar to a rubric for students marking their peers’ work to provide greater clarity of what is required for each grade in addition to providing verbal instructions and simple examples on the board.
3. In developing the questionnaire for feedback on each student’s work make the number of Likert scale options for each question match the number of grades.
4. Maintain anonymity of the peer assessor and eliminate handwriting style identification by having a digital marking sheet which when completed is emailed or printed and turned into the teacher.
5. For the digital submissions, both the teacher and the peer assessors need access to the student’s submitted work. It is better to use only one digital platform such as Google Drive, Moodle, Showbie, iTunesU or another similar digital platform as this provides consistency and can help to decrease the teacher’s workload. In this study Google Docs showed the person’s name that had uploaded the file thereby violating the anonymity for the peer assessor of who they were marking and email was very time costly for the teacher to email each individual student a separate file. Therefore a class folder on a network drive which does not show the name of the person
uploading the file may be a better option for accessibility and anonymity than other methods.

6. Students should name their file for anonymity from the beginning with clear instructions from the teacher to maintain a consistent naming convention, such as name of app and pre-assigned anonymity number (i.e. moldiv23.docx).

In conclusion, assessing tutorials created by students for new iPad apps was successful when clear direction was given prior to the Year 9 students beginning the task. The student markers also learned about the apps while marking as they had to work through the tutorial.

This Action Research study of two cycles has made a contribution to the literature on peer assessment of Year 9 students. In addition it has provided some helpful strategies for conducting peer assessment while learning new technologies such as the iPad. Teachers and students should benefit from the results and recommendations arising from this study.
Reference List


Appendix A: Individual Marking Sheet

Year 9 LFLA App1 Individual Marking Sheet

Your name please write on the BACK of this sheet (full name please!)

Number you are assessing: ____________  App you are assessing: __________________________

1. How easy are the instructions to understand?
   Difficult to understand    OK    easy to follow

2. Were the instructions accurate?
   Not really        a few mistakes       perfect

3. How is the presentation of the information?
   Difficult to read     average       very eye-pleasing

4. Was there an adequate explanation as to why one should use this app?
   No, nothing       kind of       good explanation for the purpose and use of app

5. Additional feedback about what this person can improve upon next time they make a tutorial:
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________

Encouragement for what this person did well in this assignment:
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________
   __________________________________________________________________________________

Considering the marking criteria above what mark should this tutorial receive:

A- Excellent,   B-Above Average,    C- Average,    D- needs some improvement but passable,    E- major improvement required – no demonstration of understanding
Appendix B: Individual PA Questionnaire

Individual Peer Assessment Questionnaire

Name of Student: ____________________________ Date: ______________

Please read the sentence and then tick the box that best describes your response to the sentence i.e. either “Disagree”, “Not sure”, or “Agree”

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I liked this method of marking.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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<tr>
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</tr>
<tr>
<td>I fully understood what I needed to do to mark this assignment fairly.</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

1. What would you do to improve this process of marking?

________________________________________________________________________

2. Do you believe this is a good method for improving your knowledge of iPad technologies, why or why not?

________________________________________________________________________

________________________________________________________________________
Appendix C: Individual Interview questionnaire

Interview questionnaire for individual peer assessment of new technologies:

1. What did you like best about this process?

2. What did you like least about this process?

3. Is there a way it could be better?

4. What are some of the things you learned about iPad technologies through this process?

5. Is there anything else you would like to share with me if I am planning on doing this individual peer assessment with a class next year?
Appendix D: Group Marking Sheet

Year 9 LFLA - App2 GROUP Marking Sheet

Please write your names on the BACK of this sheet (full name please!) Your group number_______

Number of group you are assessing:___________ App you are assessing:_________________

1. How easy are the instructions to understand?
   Difficult to understand   OK   easy to follow

2. Were the instructions accurate?
   Not really   a few mistakes   perfect

3. How is the presentation of the information?
   Difficult to read   average   very eye-pleasing

4. Was there an adequate explanation as to why one should use this app?
   No, nothing   kind of   good explanation for the purpose and use of app

5. Additional feedback about what this group can improve upon next time they make a tutorial:

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Encouragement for what this group did well in this assignment:

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Considering the marking criteria above what mark should this tutorial receive:

A- Excellent, B-Above Average, C- Average, D- needs some improvement but passable, E- major improvement required – no demonstration of understanding
Appendix E: Group Teams Skills Marking Sheet

Year 9 LFLA App2 GROUP Marking Sheet – working together

Your name________________________________________________________________________

Name of group member you are assessing:____________________ Group number:_________________

1. How easy or hard was this person to work with?
   Difficult to get along with   OK   easy to get along with

2. Was the work they did accurate and of good quality?
   Not really         a few mistakes   perfect

3. Did they provide the information on time?
   Late      average    on-time

4. Additional feedback about what this person can improve upon next time they work within a group:
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

Encouragement for what this person did well in working in the group:
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________
   __________________________________________________________________________

Considering the marking criteria above what mark should this person get for their ability to work well within a group:

A- Excellent,   B-Above Average,   C- Average,   D- needs some improvement but passable,   E- major improvement required – not a team player

________________________________________________________________________
Appendix F: Group Self Assessment Marking Sheet

Year 9 LFLA App2 GROUP Marking Sheet – Self assessment

Your name___________________________________________Group number:_________________

1. How easy or hard do you think you were to work with?
   Difficult to get along with   OK   easy to get along with

2. Was the work you did accurate and of good quality?
   Not really         a few mistakes   perfect

3. Did you provide the information in a timely manner?
   Late      average    on-time

4. Additional feedback about this task which your teacher can use to improve upon next time
   this assignment is presented to students:

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Encouragement for what you liked or benefited from doing this assignment:

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Considering the marking criteria above what mark should you receive for your ability to work well
within a group and for the material you produced:

A- Excellent,   B-Above Average,   C- Average,   D- needs some improvement but passable,
E- major improvement required – not a team player
Appendix G: Group PA Questionnaire

Group Peer Assessment Questionnaire

Name of Student: _______________________________ Date: ________________

Please read the sentence and then tick the box that best describes your response to the sentence i.e. either “Disagree”, “Not sure”, or “Agree”

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Not sure</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>I liked this method of marking.</td>
<td></td>
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</tr>
<tr>
<td>I feel that I learned more due to the feedback which I received.</td>
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<tr>
<td>I believe I gave a fair mark to the group which I assessed.</td>
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<td></td>
</tr>
<tr>
<td>I fully understood what I needed to do to mark this assignment fairly.</td>
<td></td>
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</tbody>
</table>

1. What would you do to improve this process of marking?

___________________________________________________________________

2. Do you believe this is a good method for improving your knowledge of iPad technologies, why or why not?

___________________________________________________________________

3. Do you believe the individual assessment or the group assessment was better? Why?

___________________________________________________________________

___________________________________________________________________
Appendix H: Group Interview Questionnaire

Interview questionnaire for group peer assessment of new technologies:

1. What did you like best about this process?

2. What did you like least about this process?

3. Which method of learning new technologies did you like better the individual or group method and why?

4. What are some of the things you learned about iPad technologies through this group assessment process?

5. Is there anything else you would like to share with me if I am planning on doing a group assessment with a class next year?
Appendix I: Individual Technology Assignment

Year 9 iPad Technology Assignment – 9 LFL A

Due Wednesday 3 September by 8:40 am emailed to your teacher (teacher’s email address)

This is a peer assessment assignment. You are to develop a digital “document” for the iPad which another student can use to understand how to use a particular iPad app. You are creating a tutorial for one simple aspect of the app you choose. This assignment should take between 1-2 hours to complete. You will be given the rest of this period and time in class on 29 August but you may have to do some work at home to complete it.

You may choose from the following apps:

- Explain Everything
- Upad
- Google Docs
- Qrafter
- Prezi
- Book Creator
- Skitch
- Garageband
- Aurasma
- iMovie
- Nearpod
- Evernote
- Overdrive
- Mindomo
- Moldiv
- iMotion

Marking criteria:

1. What is app used for?
2. How clear and easy your directions are for another student to use?
3. Are your instructions accurate?
4. Presentation of the instructions

Rules: You cannot ‘steal’ someone else’s work but you can learn from others. If you use part of someone else’s work then give them credit, but make it your own DO NOT SIMPLY COPY! Use the gorgeous brain God has given you! SAVE your work as follows: Surname_appname.docx

You cannot turn it in late as we will be marking them in class on 4 September and your teacher needs to review them before class on the 4th and save the file to a special folder for marking.

NOTES:
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
Appendix J: Group Technology Assignment

Year 9 iPad Technology GROUP Assignment 9 LFL A
Due Thursday 30 October at beginning of P2

You must bring 4 identical copies with only your group number on it (no individual names please).

This is a peer assessment assignment. You are to develop as a group a digital “document” for the iPad which another student can use to understand how to use a particular iPad app, but you must be able to print it and bring 4 copies to class on the day it is due.

You are creating a tutorial for one simple aspect of the app your group chooses. This assignment should take between 1-2 hours to complete. You will be given the rest of this period and time in class on 22 October but you may have to do some work outside of class to complete it.

Today you should as a group determine which app to make a tutorial for (please do not use any of the apps you used individually). Divide the work up so that no one individual has to “do it all” - work should be shared as equally as possible. In effect you are giving yourselves homework and then coming together on the 22 October to pull it all together.

You may choose from the following apps:

• Explain Everything
• Upad
• Google Docs
• Qrafter
• Prezi
• Book Creator
• Skitch
• Garageband
• Aurasma
• iMovie

• Nearpod
• Evernote
• Overdrive
• Mindomo
• Moldiv
• iMotion
Tell the teacher today which app your group is doing.

Group Assignment Marking criteria:

5. What is app used for?
6. How clear and easy your directions are for another student to use?
7. Are your instructions accurate?
8. Presentation of the instructions
9. Did you contribute to the group?
10. Were you easy to work with and get along with?

Rules:

- You cannot ‘steal’ someone else’s work but you can learn from others. If you use part of someone else’s work then give them credit, but make it your own DO NOT SIMPLY COPY! Use the gorgeous brain God has given you!
- Divide the work! Each group member should “pull their own weight.” Should you have a group member who is absent it will be your responsibility to contact them and work with them (unless they are absent for the full two weeks of this assignment, then 1 group member should email your teacher for advice and instructions).
- Chose to be a good group member... Easy to get along and doing your work when you say you will.
- You cannot turn it in late as we will be marking them in class on 30 October.

You will be marked by your group members on how well they thought you worked in the group and the quality of work you individually produced as well on the quality of the final product your group delivers. All group members will get the same mark for the quality of final product, but may receive different marks based on group interactions.

NOTES:
________________________________________________________________
________________________________________________________________
________________________________________________________________
Appendix K: App choices for Assignments

These apps are from the required app list for Year 9 students located on the school’s website. The following list was given to the students to choose from for both the individual and group assignments:

- Aurasma
- Book Creator
- Evernote
- Explain Everything
- Garageband
- Google Docs
- iMotion
- iMovie
- Mindomo
- Moldiv
- Nearpod
- Overdrive
- Prezi
- Qrafter
- Skitch
- Upad