STRATEGIES ON SUSTAINING FEEDBACK IN A TECHNOLOGY INTEGRATED LEARNING ENVIRONMENT (TILE)

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ABSTRACT

Feedback has been lauded as the pedagogical tool in higher education. Studies have shown feedback in classroom implementation remains an ongoing challenge. Based on past and current literature, the challenges in sustaining feedback can be mainly identified into three arguments; (1) assignments which do not allow feed forward (2) large classes (3) student's undervalued perceptions of feedback. On the other hand, effective strategies to contain the issues at hand were also discussed in the literature. Unfortunately, there is a lack of research regarding sustaining feedback on the three identified issues within a technology integrated learning environment (TILE).

The objectives of the research are, therefore:

1. To examine instructional strategies which sustain feedback for TILE
2. To identify the challenges occurred during feedback implementation in the developed TILE

Design and development research (DDR) is selected as the research design for this project. DDR is also the preferred research design because it is an applied type of research. Under the category of product and tool research, DDR recognizes the influence of the work environments. This is important because the area of study requires the collection of authentic data in "real-world" settings for contribution to the feedback practice. The students of a course were the samples for this study. The instruments used for this study are questionnaire, observation and interview.

In the data analysis, the following strategies for sustaining feedback received positive response from the students: Duration for feedforward; Feedback as an evaluated item in an assignment; Appropriate digital tools; Creating main groups and sub groups for iterative feedback; Prompt and constant flow feedback; Constructive, concise, focused and meaningful to feed-forward and feedback loop. At the same time, there were challenges which occurred during the implementation of sustaining

feedback. With the challenges, came the reminders of what needed to be avoided or adapted in the strategies for sustaining feedback in TILE. The implications of the research is that the strategies to sustain feedback in TILE need to (1) have social constructivist as its theoretical base, (2) be designed around the coursework of the subject, and (3) include active participation from the lecturers.

STRATEGI MENGEKALKAN MAKLUMBALAS DALAM PERSEKITARAN PEMBELAJARAN TEKNOLOGI BERSEPADU (TILE)

ABSTRAK

Feedback ataupun maklum balas dikenali sebagai alat pedagogi dalam pendidikan tinggi. Kajian lepas telah menunjukkan bahawa mengaplikasikan maklumbalas ketika dalam kelas adalah satu cabaran. Cabaran untuk mengekalkan maklumbalas boleh dibahagikan kepada tiga aspek iaitu:- (1) tugasan yang tidak membenarkan *feedforward* (2) kelas yang besar (3) Persepsi pelajar terhadap maklumbalas yang dianggap remeh. Dalam sudut lain, strategi yang berkesan untuk menyelesaikan tiga aspek yang dihadapi telah dibahas dalam kajian lalu. Namun, masih terdapat kurangnya penelitian dalam mengekalkan maklum balas berdasarkan tiga aspek tersebut dalam persekitaran pembelajaran yang menyepadukan teknologi *(TILE)*. Oleh itu, objektif kajian ini adalah:-

1. Untuk mengenal pasti strategi pengajaran yang dapat mengekalkan maklum balas dalam TILE
2. Mengenal pasti cabaran yang berlaku semasa pelaksanaan maklum balas dalam TILE

Penyelidikan rekabentuk dan pembangunan (DDR) dipilih sebagai reka bentuk penyelidikan untuk projek ini. Reka bentuk penyelidikan ini dipilih kerana ia adalah satu jenis penyelidikan gunaan. Di bawah kategori produk dan alat penyelidikan, DDR mengiktiraf pengaruh persekitaran kerja. Ini penting kerana kawasan kajian memerlukan pengumpulan data yang sahih dalam "dunia sebenar" untuk sumbangan bagi amalan maklum balas. Pelajar-pelajar bagi satu kursus merupakan sampel untuk kajian ini. Instrumen yang digunakan untuk kajian ini ialah soal selidik, pemerhatian dan temu bual.

Berdasarkan analisis data, strategi berikut untuk mengekalkan maklum balas menerima respons yang positif daripada pelajar: Tempoh *feedforward*; Maklum balas sebagai aspek yang dinilai dalam suatu tugasan; Pengunaan alat *digital* yang sesuai; Mewujudkan kumpulan utama dan sub kumpulan untuk maklum balas lelaran; Maklum balas yang segera dan aliran berterusan; Membina, ringkas, fokus dan bermakna untuk *feedforward* dan *feedback loop*. Pada masa yang sama, terdapat cabaran yang berlaku semasa pelaksanaan dalam mengekalkan maklum balas. Dengan cabaran, beberapa peringatan perlu dielakkan dan disesuaikan dalam strategi mengekalkan maklumbalas dalam TILE. Implikasi kajian ini adalah strategi untuk mengekalkan maklum balas dalam TILE perlu (1) mempunyai teori konstruktivis sosial sebagai asas teorinya, (2) direka bentuk bersama kerja kursus subjek, dan (3) melibatkan penyertaan aktif daripada pensyarah .

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To my two children, Zoe K. and Ellie K., I owe the greatest debt, and the greatest appreciation. To my husband, who has supported me in his ways.

I dedicate this work to Elisabeth Ng L.T. (1984-2014) and Ng Shi Ing (1981-2014), who in their life had supplied countless of inner support in my 6 years of journey and more.

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LIST OF ABBREVIATIONS

AEQ	:	Assessment Experience Questionnaire
ICT	:	Information and Communication Technologies
IM	:	Instant Messaging
JISC	:	Joint Information Systems Committee
LMS	:	Learning Management System
PAF	:	Podcasting Assignment Feedback
PoBL	:	Project based Learning
TILE	:	Technology Integrated Learning Environment
ZPD	:	Zone of Proximal Development

LIST OF APPENDICES

CHAPTER 1: INTRODUCTION

The intention of higher education is to develop graduates who will be self-directed lifelong learners (Boud & Falchikov, 2007).

This is no exception in Malaysia.

> *"The purpose of education is the holistic development of character and capabilities, the acquisition of specific skills, the realisation of intellectual, physical and spiritual potential, and the training of human capital." (pp.13)*
>
> Ministry of Higher Education-MOHE, 2007

MOHE has set-up a profile of the desired human capital or qualities and dispositions according to three elements: knowledge, personal, and interpersonal attributes. The model of desired human capital (Figure 1.1) is illustrated below:

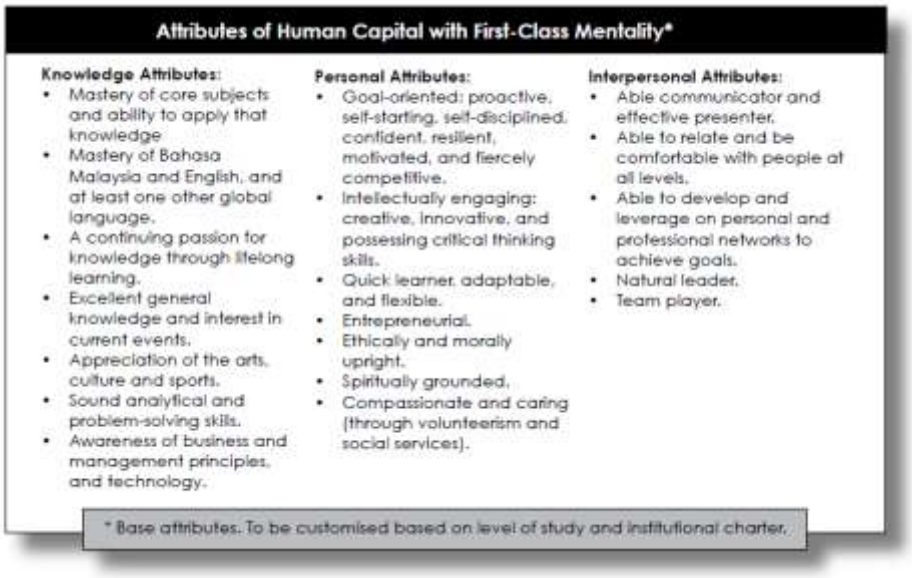


Figure 1.1 Attributes of Human Capital with First-Class Mentality

Consequently, there is an urgent need for higher education institutions to re-formulate learning processes to instill these qualities in the students.

In the realm of higher education, re-engineering the learning process includes realigning the structure of the curriculum for the course-subject which allows ample and on-going opportunities for students to perform and receive constant suggestions for self-development. For this reason, assessment is pertinent for the growth of the students during and after their higher education (Boud, 2000). This is because at different stages during higher education, students need chances to reflect on what they have learnt, what they still have to learn, and how to evaluate themselves (Chickering & Gamson, 1987).

In a similar vein, Candy, Crebet, and O' Leary (1994) on the mission of assessment in advocating lifelong learning amongst undergraduates, describes:

> *"…if students are to be encouraged to be lifelong learners, they must be weaned away from any tendency towards over-reliance on the opinions of others. Ultimately, in real world contexts, they must be able to judge or evaluate the adequacy, completeness or appropriateness of their own learning, so whatever assessment practices are used must be comprehensible to the learners so that they can be internalised as criteria for critical self-evaluation." **(pp.50)***

Assessment is a form of measurement process, subject to the principles of measurement (reliability, reference points, validity, and record-keeping) where the word 'measurement', as used here, is defined in the broadest sense of "determining the degree of something" (Earl & Katz, 2006). The definition of assessment is further refined by Keppell, Au, Ma and Chan (2006) by identifying assessment as "a search agent on the condition of students' teaching and learning as it grants an examination of what the student understands and does not understand".

Assessment is an integral part of students' lives from the first day they set their foot in higher education. Its deep influence on students' learning (Gibbs & Simpson, 2004)

includes how time is divided for their study, which courses are being prioritised and how much quality is being given to the coursework, and test. In other words, assessment is the key agent in charting the students' progressive transformation within the learning process. To enable this development, students should be drawn to understand the assessment process (Elwood & Klenoswki, 2002). This condition can be coined as assessment for learning.

Assessment for learning is characterized as being formative and diagnostic (Bloxham & Boyd, 2007). The core purpose of such assessment is learning-oriented whereby learning comes before measurement (Carless, 2003; Juwah,Macfarlane-Dick, Matthew, Nicol, Ross & Smith, 2004). It is developed to ensure a clear visible understanding from each student. Prior to that, lecturers can decide what they can do to assist students' growth. According to Earl and Katz (2006), students learn in individual, idiosyncratic ways, yet, at the same time, there are predictable patterns of connections and preconceptions that some students may experience as they move along the continuum from emergent to proficient. In assessment for learning, lecturers use assessment as a diagnostic tool to ascertain their students' prior and current knowledge and skill, and what possible confusions, preconceptions, or gaps in comprehension they might have. The extensive and diverse information which the lecturers gathered in regards to their students' learning processes becomes the indispensable cue to unlock the next steps they need to perform next in order to push students' learning forward. It also becomes the foundation in providing descriptive feedback for students and acts as a determining factor on groupings, and instructional strategies (Earl & Katz, 2006).

Therefore, this study intends to delve into feedback which is the formative method of assessment for learning. Based on the philosophy behind assessment for learning, the study takes another step further by extracting plausible strategies which will transform feedback as the means to unlock the steps towards students' learning forward.

1.1 Feedback and its role in higher education

> *"Learning depends on knowledge of results, at a time when, and at a place where, the knowledge can be used for correction."(Bruner, 1970, pp. 120)*

Feedback is learning, both formal and informal (Biggs, 1999; Brown & Knight, 1994,). Feedback has been conceptualized in various ways. According to Bruner (1970), feedback was viewed as an issue of "correction of errors" or "knowledge of results". Much later, Ramaprasad (1983), and Sadler (1989) conceptualised that feedback is information about the gap between the actual level and the reference level of a system parameter which was used to alter the gap in some way.

Feedback is further elaborated on "*as information with which a learner can confirm, add to, overwrite, tune, or restructure information in memory, whether that information is domain knowledge, meta-cognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies*" (Butler & Winne, 1995). On the same ground, Nicol and Dick (2006) interpreted feedback as data about how the student's present capacity (of learning and performance) influences the objectives and expected standards of the course. In other words, it is also illustrated as the 'consequence' of a performance (Hattie & Timperley, 2007). In this study, feedback is interpreted as a pedagogical tool which bridges the student current level to the expected level set by the course.

A number of influential researches have confirmed that feedback plays a decisive role to students' learning (Black & Williams, 1998b; Hattie & Jaeger, 1998; Hounsell, 2003; Yorke, 2003). In other words, learning without feedback is unproductive for the learners (Laurillard, 1993). Feedback provides the motivation force for learning (Narciss & Huth, 2004; Shute, 2008) which elevates their self-esteem as learners (Crooks, 1988) and develops their identities as learners (Orrell, 2006). Subsequently,

students learn faster and much more effectively when they have a clear sense of how well they are doing, and what they might to do in order to improve (Hounsell, 2003).

The significance of feedback has been widely acknowledged in higher education. Feedback is often termed as "the most important aspect of the assessment process in raising achievement" (Bloxham & Boyd, 2007). In fact, the students in higher education have regarded feedback as a vital element in shaping and improving their learning experience (Covic & Jones, 2008; Price, Handley, Millar & O' Donovan, 2010; Williams & Kane, 2009; Yorke, 2003).

1.2 Problem Statement

1.2.1 The Problems

Unfortunately, feedback as the pedagogical tool in higher education is not short of quandary. Literature have shown feedback in classroom implementation remains an ongoing challenge such as structural limitations of mass higher education (Hounsell et al. as cited in Yang & Carless, 2012); insufficient in helpfulness, timeliness, consistency, specificity and clarity (Bailey & Garner as cited in Yang & Carless, 2012); students neglecting to collect feedback or seek help after receiving negative feedback (Price, Handley, & Millar 2011). Based on the issues in the past and current studies, the challenges in sustaining feedback can be identified into three arguments; (1) Assignments which do not allow feed forward (2) Large classes (3) Student's undervalued perceptions on feedback

(a) ***Assignments which do not allow feed forward***

In higher education, there is a lack of opportunity for students to directly use feedback (Juwah et al., 2004). For a single course, students are plagued with loads of assignments, mid-terms and examinations. By the time the students receive the feedback, they have already proceeded to the next assignment. This prevents the students from benefitting on the received feedback. In addition, the brief timeline for the resubmission on the given assignments does not allow for application of previous given feedback. Such expensively provided feedback is likely to be wasted (Gibbs & Simpson, 2003) as students will pay little or no attention to feedback.

(b) ***Large-classes***

Black and William (1998) stated feedback activity can be a challenge for teachers with large classes. Many good answers went unrecognized in a large group setting (Kulik & Kulik, 1988) as these teachers are constrained with heavy workloads. Ultimately this will push the teachers to think practicing feedback is both impractical and too time-consuming (Carless, 2007). As a result, it becomes incompatible with the demands of schooling.

(c) ***Students' undervalued perceptions of feedback***

It was noted by Sadler (1989) that even when teachers supply learners with conclusive and dependable feedback on the their work quality, betterment does not necessarily follow. This is due to the students' low reception of feedback. Gibbs and Simpson (2003) highlighted that students ignore feedback with impunity because there is often no follow-up to check if they have acted on it.

At the same time, students may have also encountered various problems in applying feedback strategies (Nicol, 2006; Winne, 1982) such as [a] having difficultly or failing to recognize conditions (tasks, cues) under which feedback might be employed

profitably, [b] misperceiving tasks goals and then mismatch feedback to a task's actual conditions, [c] failing to execute the feedback effectively due to lack proficiency in deploying them, and [d] lacking the motivation to spend the effort required to apply feedback.

1.2.2 Feedback being effective

Prior to the feedback practices that reflect a pressured environment, there have been numerous studies on what qualifies as effective feedback as a counter measurement. Table 1.1 illustrates such studies. Black (2000) listed these four items needed to ensure feedback is effective; clear goals for feedback, clear measurement of students' progress within the given feedback, high quality of advice contain within the given feedback and feedback as a tool to close the gap between student's current learning and the learning outcome of the course. Gibbs (2006) pointed out similar characteristics with an additional element which is feedback should be timely. According to Gibbs, a timely feedback allowed the students the opportunity to digest and apply on their work. On the other hand, Nicol and MacFarlene's (2006) study on effective feedback did not include this element. They put forth a new outlook on what made feedback effective; inspires learning which revolves around teacher and peer dialogue, boosts motivational and positive self-esteem and beliefs, and supply materials to teachers to assist in their teaching. Finally, the simplified list by Irons (2008) reflected no change on what determines effective feedback. Therefore, in order to resolve the three issues which have been long plaguing feedback, strategies are developed based on the four studies.

1.2.3 Feedback strategies

(a) ***Issue: Assignments which do not allow feed forward***

Strategy: It is only fitting if the courses are carefully planned and designed to allow engaged-feedback practices. From merely being in a transmission position, students also need to be active agents either as feedback constructors or

Table 1.1

Studies on the Characteristics of effective Feedback

Black (2000)	Gibbs (2006)	Nicol & MacFarlene-Dick (2006)	Irons (2008)
1. Goals(learning objectives need to be clear to students) 2. Feedback should measure (give guidance to) the student's current learning status 3. Feedback should be used as a means for closing the gap between the student's learning state and the learning goals 4. Feedback needs to high quality and effective in its advice.	1. Sufficient feedback is provided, both often enough and in enough detail 2. Feedback focuses on students' performance, on their learning and on actions under the students' control, rather than on the students themselves and on their characteristics 3. Feedback is timely in that it is received by students while it still matters to them and in time for them to pay attention to further learning or receive further assistance 4. Feedback is appropriate to the purpose of the assignment and to its criteria for success 5. Feedback is appropriate, in relation to students' understanding of what they are supposed to be doing	1. Helps clarify what good performance is (goals, criteria, standards) 2. Facilitates the development of self-assessment and reflection in learning 3. Delivers high quality information to students about their learning 4. Encourages teacher and peer dialogue around learning 5. Encourages positive motivational beliefs and self esteem 6. Provides opportunities to close the gap between current and desired performance 7. Provides information to teachers that can be used to help shape teaching.	1. Be understandable by students 2. Be valued by students 3. Be of appropriate quality 4. Be timely 5. 'Close the gap" on their understanding 6. Provide an opportunity for dialogue

seekers (Boud, 2007; Nicol & MacFarlane, 2006; Sadler, 1998). Engaged-feedback practices include indulging chances for resubmission, a vital role in learning (Boud, 2000) and dialogue. Laurilliard (2002) maintained that teacher-student conversation is very important if feedback was to be efficient in higher education. This dialogue form permits students to have the chances to have active discussion with the teacher about the feedback. An iterative yet rich dialogue-form enables the students to understand, reflect and apply concepts and ideas in the learning tasks (Lauriliard, 2002). In this study, the concept of dialogue is applied in the feedback culture. The purpose is also to resolve the issue of large classes, a proven thorn in sustaining feedback.

(b) ***Issue: Large classes***

Strategy: Encapsulating peer learning is recommended as the measure to address this bottleneck. Peer learning provides enriching possibilities for feedback. An effective and productive application of feedback via peer learning in a large class will be seen in activities such as peer commenting, and collaborative authorship whereby students produce feedback comments (Nicol, 2010). In other words, peer learning focuses on students simultaneously learning and contributing to other students' learning (Boud, Cohen & Sampson 2001). Boud et al. (2001) also explained this is built upon the students' mutual experiences which acts as a leverage for equal contributions amongst the students' community. In order to create this condition, the course needs to be designed accordingly. It has also been acknowledged that technology is a vital elevator towards the use of peer learning (Boud et al. 2001). Thus, peer learning, another similar element of the dialogue concept is infused in this research.

(c) ***Issue: Students' undervalued perceptions of feedback***

Strategy: In order to change students' recognition towards feedback, there should be an increase of students' involvement in the generating of feedback (Boud & Falchikov,

2007). This will lead to substantial modification to the learning environment where it involves turning the learning culture around within a regular classroom practice (Sadler, 1998). This research, therefore, looks into students' involvement as part of the design that facilitates the use of feedback to help students learning.

1.2.4 Feedback and ICT

The increased existence of information and communication technologies (ICT) and its overwhelming influence on teaching and learning cannot be ignored. Jonassen, Howland, Morre and Marra (2003) interpreted ICT as a process of amplifying teaching and learning; a process of empowering learners and preparing students with relevant skills needed for the future. Wang and Kinuthia (2004) explained technology enhanced learning environments as having four characteristics: 'using technology to motivate people, using technology to enrich learning resources, using technology to implement learning and instructional strategies and using technology to assess and evaluate learning'. Elliott (2007) argued that ICT is used as a tool to metamorphose feedback in a contemporary collaborative and personalised learning context. As technologies continue to advance, Mory (2004) suggested that there is a need to design feedback which utilizes the improved capabilities for instruction. Hence, there is a need for strategies which could prescribe suitable instructions and tasks for sustaining feedback in a technology integrated learning environment (TILE) which advocates learning. To date, however, the potential domain of sustainable feedback and the relationship with ICT tools have not been investigated systemically.

From here, the problem statement is the lack of instructions for sustaining feedback in the three issues within TILE.

1.3 Research Objectives

For this research, it is assumed that feedback will be sustained if the three identified issues; (1) Assignments which do not allow feed forward (2) Large classes (3) Student's undervalue perceptions on feedback, are contained. At the same time, instructional strategies which evolve around technology integrated learning environment need to be developed and managed to ensure feedback retains its pivotal role in the teaching and learning process.

The objectives of the research are:

1. To examine instructional strategies which sustain feedback for a technology integrated learning environment (TILE)

2. To identify the challenges occurred during feedback implementation in the developed technology integrated learning environment (TILE)

1.4 Research Questions

The following research questions will guide the investigation.

1. What instructional strategies will sustain feedback in a technology integrated learning environment (TILE)?

2. What are the challenges which occur during feedback implementation in a technology integrated learning environment (TILE)?

1.5 Significance of the study

The results of the study will benefit teachers in higher education and curriculum designers as they will be able to deploy apt prescriptions for sustaining the feedback process in different situations. Moreover, they are able to develop the flow of the course with feedback for learning as the pedestal. Feedback requires various stages of support for students' comprehension and competence to perform on that feedback in a technology blended learning environment. Concurrently, the role of both teacher and students also changes according to the different points of the continuum which spans from the first day of the semester to the end of the course. Prior to that, the teacher will assist the students to

- understand (1) What constitutes feedback (2) What type of feedback is appropriate
- cultivate the following skill:- (1) When they [students] can expect their feedback while encouraging them to think about the activities on which they have received feedback, (2) what type of feedback they need to enhance learning and (3) take full ownership of their learning (Irons, 2008).

Subsequently, this increases the probability of students being able to immerse themselves in learning via feedback. Therefore, this empowers students to achieve higher quality learning outcomes than they might otherwise have attained, and by enabling them to accomplish these outcomes more rapidly.

1.6 Conceptual Framework

The conceptual framework in Figure 1.2 proposes a productive form for research purpose. As mentioned earlier, issues (large class, students' under-valued perceptions towards feedback, and assignments which do not allow feed-forward) which have been plaguing feedback integration should be weeded. Therefore, the design of the

conceptual framework juggles and capitalises on these elements: technology tools, community and the role of the teacher, to keep these issues at bay.

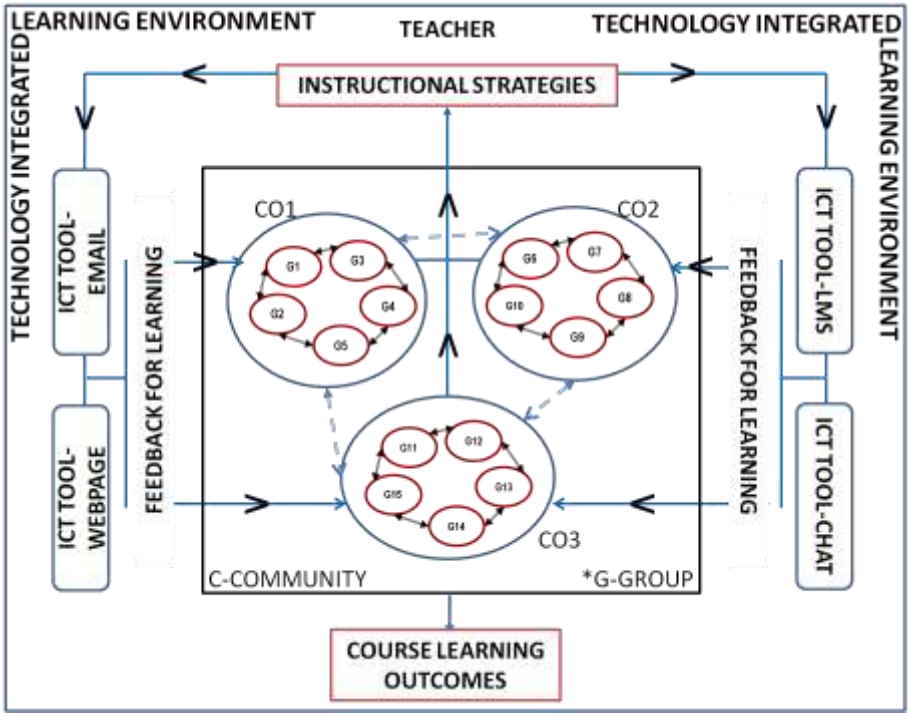


Figure 1.2 Conceptual framework for the study

As seen in Figure 2, the iterative flow of instructional feedback strategies allows the teacher to capture and filter which strategies are to be continued or modified. This is achieved by observing and analyzing the responses received from the students' feedback via ICT tools. Within this framework, feedback for learning carries the objective: - to guide students towards the learning outcomes of the course.

1.6.1 The role of the teacher

The starting point of the conceptual framework in distilling prescriptive instructional feedback is the teacher.

> *"All (classroom) work involves some degree of feedback between those taught and the teacher, and this is entailed in the quality of their interaction which is at the heart of the pedagogy. The nature of these interactions between the teachers and students...will be key*

determinants for the outcomes of any changes..." (Black and Williams, 1998, pp. 16)

The teacher helms the course by orchestrating feedback towards the course learning outcomes. Moreover, the students also need coaching, sometimes even external guidance, in the situation of learning processes (Schelfhout, Dochy & Janssens, 2004). On that account, a certain level of teacher-control needed to be installed in the learning environment (Carpenter & Fennema, 1992; Schwartz & Bransford, 1998).

1.6.2 Community

In higher education, it is common to assume that the teacher becomes the feedback provider. Nevertheless, students do also give each other feedback while performing the same given tasks (Nicol, 2011). In addressing the issue of large classes, the notion of peer learning is capitalized and integrated. This is based on the concepts of social constructivism, zone of proximal development (ZPD) (Vygotsky, 1978) and communities of practice (Wenger, 1998). Learning is a highly social activity (Pritchard & Wollard, 2010). In that event, the class learning is designed to move socially as a community. Within the social learning environment, the setting of community bubbles (C01, C02, and C03) is to maximize the performance of peer learning and peer-feedback among the contained groups (G).

1.6.3 Technology tools

Throughout the journey in the course, the teacher delivers and disseminates the instructional strategies with the assistance of ICT tools. Technology is a tool which can aid teachers to embody the best practices in order to create enriched and collaborative learning environments, meet a variety of learning style needs, support learning transfer, address high-level thinking, make education equitable, incorporate real world problems and authentic assessments and prepare students for the need of lifelong learning (Fullan

;Osório & Machado ;Paiva ; Ponte & Serrazina ; Romero & Silva ;Silva as cited in Coutinho, 2007).

The teacher provides the chances for students to engage in feedback via the ICT tools: email, Google Sites; a structured type webpage, Learning Management System (LMS), and Instant Messaging (IM). Table 1.2 illustrates the specific examples used for each ICT tool.

These tools support the feedback process for student learning. Specifically, e-learning approaches provide fresh options for students to be part of a digital learning community by communicating on a daily term (Macdonald, 2004). This element is crucial for students to give their response in order for the feedback loop to be completed, as this will reflect if learning has occurred from feedback (Sadler, 1989). Boud (2000) voiced this as one of the most discarded elements in formative assessment. Description and literature on the tools are described in Chapter Two and how each tool was applied in the course for the purpose of sustaining feedback is provided in Chapter Three.

Table 1.2

Specific Examples for Each ICT Tool

ICT tools	**Example of ICT tools**	**Purpose**
Learning Management System (LMS)	Moodle	File repository, Class activity such as forum, quiz, questionnaire
Webpage	Google Sites	Eportfolio Assignment to showcase students reflections on their learning journey
Email	Gmail	Communication tool between teacher-students, student-student

Instant Messaging (IM)	Yahoo Chat, GoogleTalk, Facebook Chat, MSN Messenger	'Instant' communication tool

1.7 Limitations and delimitations

Several aspects of this research could have affected the study in such a way as to decrease the confidence in the data findings. First limitation is the scale of the study. This research is a localized small-scale study in a public higher institution of learning in Malaysia. Not only that, the focus is on a group of pre-service teachers. However, higher institution contains various fields with different student groups. Consequently, findings cannot be generalized to all higher education institutions of learning in Malaysia without a needs analysis done in their own setting. Second limitation was that the research process for the study was done as a one time. In order for substantial findings, the research process should be done more than one time. These limitations are acknowledged within the context of recommendations for further research in Chapter 6.

1.8 Definition of terms

Feedforward: It is an expansion of excellent feedback. It is described as the proactive direction which facilitates the learners to move forward (Conaghan & Lockey, 2009) To elaborate further, feedforward can be interpreted as follows: "…suggestions for what can be done next. In particular, advice about how to improve the next element of work can be particularly helpful to students receiving feedback, especially when this advice is received during the progress of the work, so that adjustments can be made in an ongoing manner (Brown, 2007, pp.5)."

Feedback loop: Sadler (1989) explained feedback loop comprised of "... a teacher who knows which skills are to be learned, and who can recognize and describe a fine

performance, demonstrate a fine performance, and indicate how a poor performance can be improved."

1.9 Organization of the study

Chapter one comprises of the following; background of the study, the problem statement, the purpose of the study, the research questions, and the conceptual framework. It also includes limitations and delimitations of the study.

Chapter two explores literature on other learning theories which frame the design and characteristics of instructional strategies for sustaining feedback. This chapter also looks into the literature of other models in sustaining feedback.

Chapter three describes the elements which frames the instructional strategies for sustaining feedback in a technology integrated learning environment (TILE). Prior to that, the next step was to apply the proposed strategies developed according to elements. The next half of the chapter illustrates the process of developing and managing the learning environment for sustaining feedback in TILE.

Chapter four outlines the methodology procedures used in this study such as the research design, sampling, instruments used, data collection process and data analysis. The methodology applied attempts to answer the research questions.

Chapter five describes the research findings and discussions according to the research questions.

Chapter six condenses the results in the previous chapters to provide answers to the research questions. There will be a discussion on the findings and recommendations for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

The chapter is organized into two parts:-

Part I discusses the literature which defines the baseline from which this research was set out. Part II describes the theoretical framework which guides the development of instructional strategies for the feedback process in a technology integrated learning environment (TILE).

The chapter concludes by considering the implications of the presented research literature for this study.

2.2 Part I: Feedback process: Strategies to sustain

Numerous studies have revealed that managing feedback with proper instructions would generate significant results in teaching and learning (Black & William, 1998; Higgins, Hartley & Skelton, 2001; Sadler, 1998). Based on the scholarly writings, there was an increase in the attempts to prescribe strategies ranging from developing models or frameworks to designing specific strategies for managing feedback in higher education (Boud & Molloy, 2012).

2.2.1 Models, framework/concept and guidelines which set the strategies

These five models/frameworks/guidelines were chosen because each of them consists of elements which are crucial in sustaining feedback in TILE. The models/frameworks/guidelines are:-

i. Model of formative assessment and feedback, Butler and Winne (1995)
ii. Divergent and Convergent formative assessment, Torrance and Pryor (2001)
iii. Feedback Model, Hattie and Timperley (2007)
iv. Dialogic feedback cycle, Beaumont, O'Doherty and Shannon (2008)
v. Dimensions of formative feedback and assessment, Hatzipanagos and Warbuton (2009)

2.2.1.1 Model of formative assessment and feedback

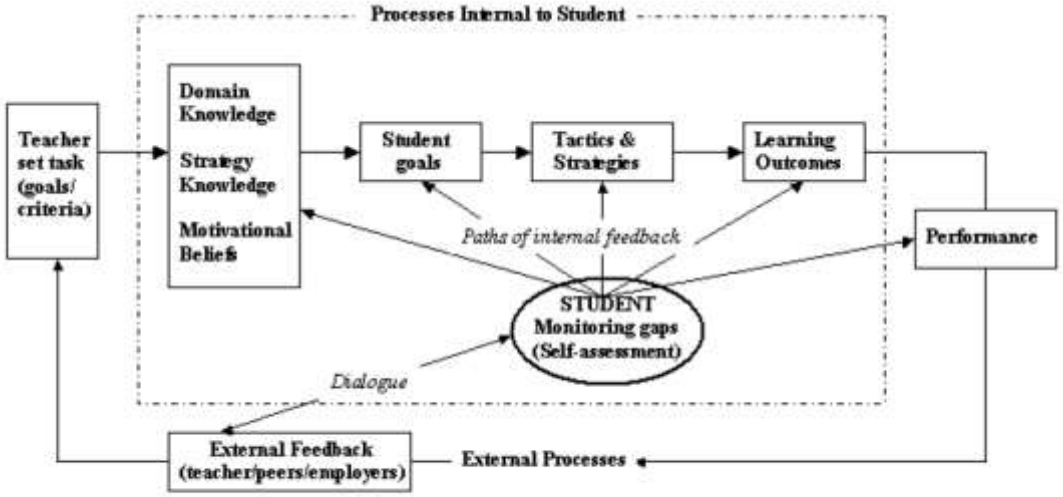
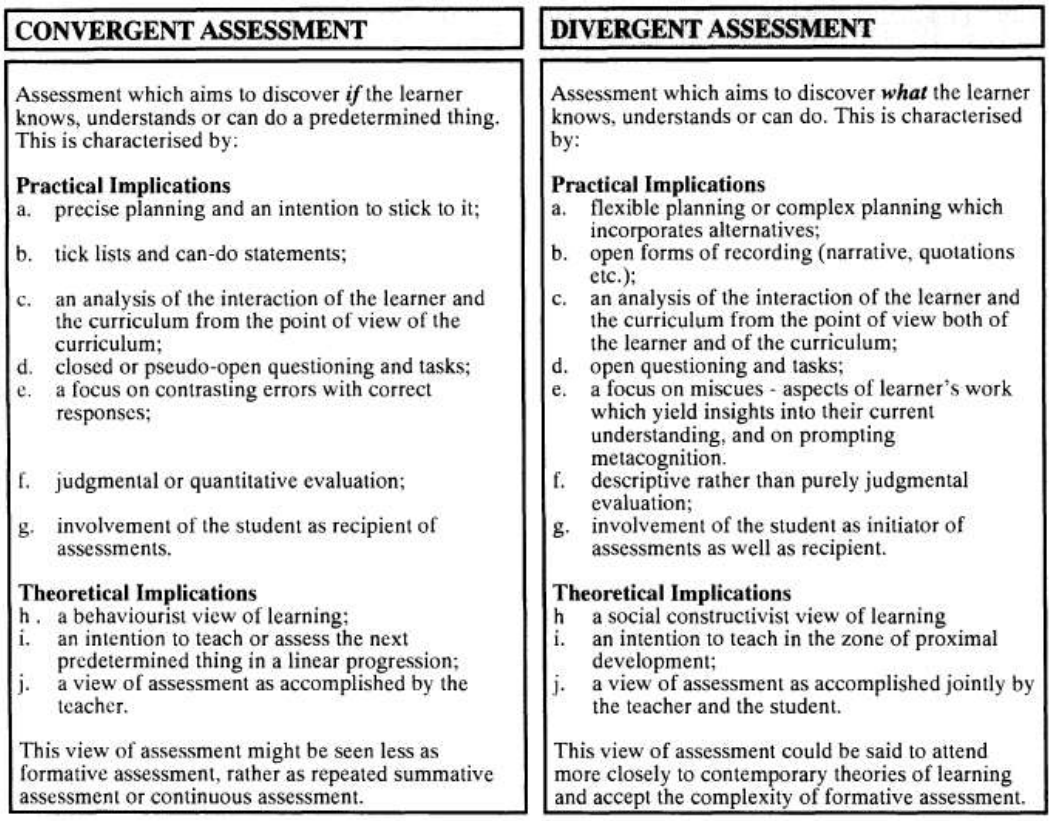


Figure 2.1 Model of formative assessment and feedback (Butler & Winne, 1995)

The model of formative assessment and feedback by Butler and Winne (1995) capitalized on self-regulated learning. The students were placed as central figures. With such placement, the students held to an active role in the feedback process. This role includes the scope of tracking and administering their own performance in the aspect of their learning aims and approaches employed to obtain the learning aims. Butler and Winne (1995) explained that the beginning point for the feedback process was the academic task e.g an assignment, set by the teacher (in class). In order to be engaged with the given academic task, the students need to depend on their prior knowledge and compose a personal analysis on the task requirements. The interactions which occurred during this process, created internal feedback. It was pointed out that such internal feedback was developed from a comparison between current progress and internal goals and further actions were taken to bridge these gaps. This self-generated feedback information might lead to a re-interpretation of the task or to the adjustment of internal goals or of tactics and strategies. The model also illustrated that student would receive external feedback from teachers or peers. Butler and Winne added that the student needed to interpret and internalize the feedback given by the teacher before it can bring

impact on the subsequent action. Therefore, this step has crucial implications for feedback processes in higher education. This model brings to light an important factor. In order to sustain feedback, it needs to have the students be very much involved in the feedback process. The students need to know how to monitor and regulate their progress. Subsequently, the students would digest the feedback to assure positive progress towards the intended learning outcomes.

2.2.1.2 Divergent and Convergent formative assessment



CONVERGENT ASSESSMENT

Assessment which aims to discover ***if*** the learner knows, understands or can do a predetermined thing. This is characterised by:

Practical Implications

a. precise planning and an intention to stick to it;
b. tick lists and can-do statements;
c. an analysis of the interaction of the learner and the curriculum from the point of view of the curriculum;
d. closed or pseudo-open questioning and tasks;
e. a focus on contrasting errors with correct responses;
f. judgmental or quantitative evaluation;
g. involvement of the student as recipient of assessments.

Theoretical Implications

h. a behaviourist view of learning;
i. an intention to teach or assess the next predetermined thing in a linear progression;
j. a view of assessment as accomplished by the teacher.

This view of assessment might be seen less as formative assessment, rather as repeated summative assessment or continuous assessment.

DIVERGENT ASSESSMENT

Assessment which aims to discover ***what*** the learner knows, understands or can do. This is characterised by:

Practical Implications

a. flexible planning or complex planning which incorporates alternatives;
b. open forms of recording (narrative, quotations etc.);
c. an analysis of the interaction of the learner and the curriculum from the point of view both of the learner and of the curriculum;
d. open questioning and tasks;
e. a focus on miscues - aspects of learner's work which yield insights into their current understanding, and on prompting metacognition.
f. descriptive rather than purely judgmental evaluation;
g. involvement of the student as initiator of assessments as well as recipient.

Theoretical Implications

h a social constructivist view of learning
i. an intention to teach in the zone of proximal development;
j. a view of assessment as accomplished jointly by the teacher and the student.

This view of assessment could be said to attend more closely to contemporary theories of learning and accept the complexity of formative assessment.

Figure 2.2 Model of classroom assessment-convergent and divergent assessment (Torrance & Pryor, 2001)

Torrance and Pryor (2001) brought the concept of feedback to a distinct level. They stressed that any systematic attempt to improve the quality of interaction and the significant impact of formative on learning, social construction and accomplishment of classroom assessment were to be prerequisite of such attempts. With that in mind, they developed a model of two types of formative assessment: convergent and divergent assessment (refer to Figure 2.2) which highlighted an intersubjective social process

where the purpose of both assessments was accomplished by interaction between students and teachers. Since convergent assessment was based on a behaviourist view of learning, it addressed more precisely the successful completion of the task in hand, and whether students could manage a specific assignment. Torrance and Pryor related this to "*normative criteria with a primary concern of the relay of the curriculum"*. On the other hand, divergent assessment held to social constructivist view of learning which involved a more open engagement with what the student could do. Hence, the learner's agenda was approached with a more dialogic, conversational form of language. The focus of this research is the other half of the formative assessment: divergent assessment. In this study, feedback is categorised as a form of assessment for learning. This resonates well with the theoretical implications of divergent assessment. The practical implications for this form of assessment provide the research with a form of guide in developing the strategies for sustaining feedback.

2.2.1.3 Feedback Model

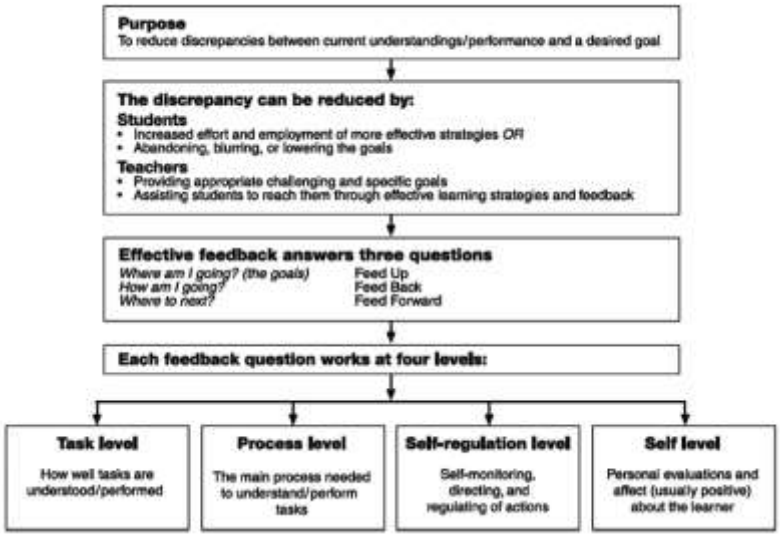


Figure 2.3 Feedback Model (Hattie & Timperley, 2007)

Feedback model by Hattie and Timperley (2007) is another model used to steer the study in constructing strategies in sustaining feedback. Hattie and Timperley (2007) believed that the sole objective of feedback is to lessen the gap between present

comprehension and performance and a goal. A feedback model was conceptualized based on this objective (Refer to Figure 2.3). In order to address the discrepancies, feedback must answer three main questions asked by a student and/or by a teacher: Where am I going? (What are the goals?), How am I going? (What progress is being made toward the goal?), and Where to next? (What activities need to be undertaken to make better progress?).

These important questions corresponded to the concepts of feed-up, feed-back, and feed-forward. They indicated that how effectively the answers towards these questions serve to lessen the gap is partly dependent on the type of level at which the feedback operates. The questions become a standard format in the feedback content for the students for this study. The effectiveness of the questions is brought forward by the four levels as shown in Figure 2.3.

There were four types of levels: (1) feedback about the task (such as feedback about whether answers were right or wrong or directions to get more information), (2) feedback about the processing of the task (such as feedback about strategies used or strategies that could be used), (3) feedback about self-regulation (such as feedback about student self-evaluation or self-confidence), and (4) feedback about the student as a person (such as pronouncements that a student is "good" or "smart"). These four levels assisted in shaping the strategies needed to sustain feedback. It also brought to our attention that these aspects cannot be neglected.

2.2.1.4 Dialogic feedback cycle

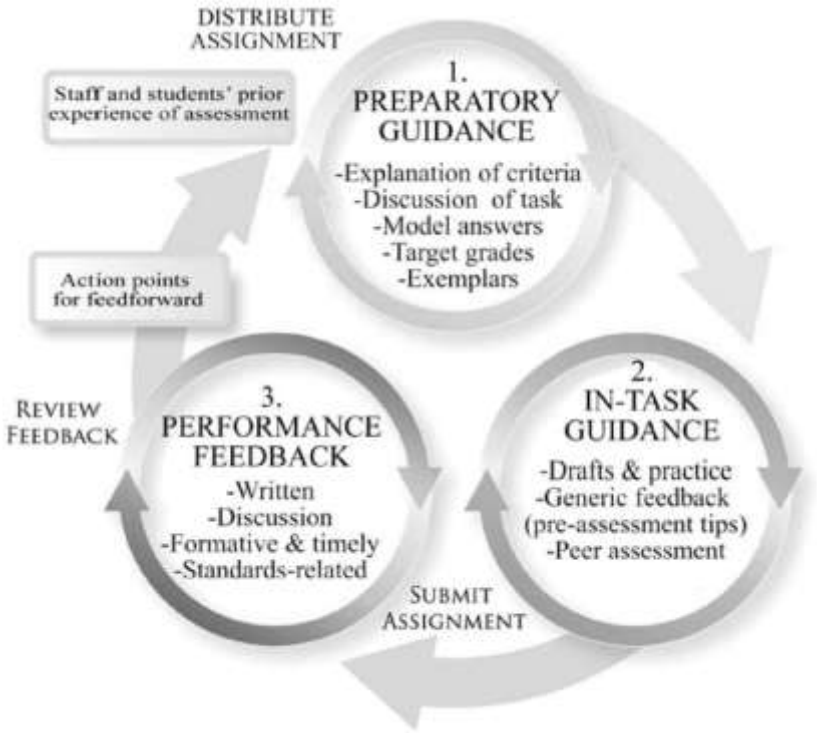


Figure 2.4 Dialogic feedback cycle (Beaumont, O'Doherty, & Shannon. 2008)

Dialogue can be interpreted as a form of relationships in which participants think and reason together (Gravett & Petersen 2002). A number of studies have revealed that dialogue is a useful tool for accommodating the different perceptions of both teachers and students during the feedback process (Adcroft; Carless; Maclellan as cited in Yang & Carless, 2012). With that similar purpose, Beaumont, O'Doherty, and Shannon (2008) designed the dialogic feedback cycle (refer to Figure 2.4). Based on the strong purpose towards the dialogue tool, the study has adopted this cycle. The cycle which consisted of three stages comprising of activities that students frequently referred to.

The following is the description of each stage for the dialogic feedback cycle:-

(1) Preparatory guidance stage

Integrate students more effectively into an agreed academic community of practice through 'front loading' feedback as preparatory guidance

(2) In-task guidance stage

Encourage staff/student engagement with formative feedback to maximise 'feedforward': viewing feedback as a single event does not enhance the student experience.

(3) Performance feedback stage

It is usually delivered in both written and verbal form, again providing opportunity for dialogue.

Each stage was also represented as a cycle to focus on the iterative dialogue which often highlighted by students. This was crucial in order to ensure the students thoroughly understand the knowledge churned within the cycle and are well prepared in for each stage before moving to another stage. The stages were utilized in the design of the course selected for this study. This was because one of the objectives of the research was to make feedback to feed-forward and to complete the feedback loop.

2.2.1.5 Dimensions of formative feedback and assessment

Dimension	Identified attributes of feedback
Power (autonomy and ownership)	Support management of own learning (self-regulated learning) Improve levels of (student) confidence Increase responsibility and autonomy
Dialogue	Ensure feedback is provided often enough and inadequate detail Support peer/tutor dialogue Allow students to respond to feedback Support questioning Share assessment criteria
Timeliness	Quantity and timing of feedback The feedback is prompt (provided quickly enough to be useful to students)
Visibility	Discern student-learning needs/prior knowledge Be able to 'spot' unpredicted achieved outcomes
Appropriateness	Feedback: is understandable to students is linked to learning outcomes (constructive alignment) is linked to the assessment criteria focuses on learning rather than on marks or students themselves
Action	Feedback is received by students and is acted upon Task–performance–feedback cycles are facilitated Help students set personal goals
Community	Support the learning communities Support peer assessment
Reflection	Encourage reflection on the work Compare actual performance with a standard and take action Provide information to tutor to help shape teaching (reflection in action/ on action) Develop skills in self-awareness

Figure 2.5 Dimensions of formative feedback and assessment (Hatzipanagos & Warburton, 2009)

When examining the wide area of literature in the aspect of formative assessment, Hatzipanagos and Warburton (2009) identified possible to other characteristics which can be deciphered under a number of key formations. Hatzipanagos and Warburton (2009) created a summary of attributes for formative feedback and assessment which had been categorized to various dimensions. Each dimension is supported by a set of attributes for formative feedback and assessment. In other words, the described attributes from a panel of literature of formative assessment, provide the study useful insights for the instructional strategies of sustaining feedback in TILE. Furthermore, the dimensions was derived from the study by Hatzipanagos and Warburton (2009) on their initial concern on providing suitable formative assessment methods for online-distanced learning, virtual learning environment and computer-mediated communication.

According to Hatzipanagos and Warburton, the core to sustaining feedback to the three situations is dialogue. The study strike a resembling note to this research. In other words, proposed strategies have echoed the same dimensions and identified attributes of feedback. In this research, the dimensions and its descriptors were applied in designing and developing the strategies in sustaining feedback throughout the course.

2.2.1.6 Relationship between the chosen model/ guidelines and the research study

The application of the five chosen models / guidelines in regards to the research study is summarized in the table below:-

Table 2.1

Application of the five chosen models / guidelines on the research study

The elements used for the feedback process	How the elements were embedded in the feedback process
Model of formative assessment and feedback, Butler and Winne (1995) • Students as active key figures in the feedback process • The starting point for the feedback process will be the academic task e.g an assignment, set by the teacher (in class)	Refer to Chapter 3: 3.2 Design of the assignments

(table continues)

The elements used for the feedback process	How the elements were embedded in the feedback process
Divergent and Convergent formative assessment, Torance and Pryor (2001) • Adopted divergent assessment – a social constructivist view of learning which involves a more open engagement with what the student can do. • Learner's agenda is approached with a more dialogic, conversational form of language.	Refer to Chapter 3: 3.2 Design of the assignments; 3.4 Provision of assistance for students' performance in the course; 3.5 The use of technology to execute the assignment and facilitate feedback
Feedback Model, Hattie and Timperley (2007) • The content in feedback must consist of the following elements: feed-up, feed-back, and feed-forward. • Three questions to guide the teacher in writing feedback to students: Where am I going? (What are the goals?), How am I going? (What progress is being made toward the goal?), and Where to next? (What activities need to be undertaken to make better progress?)	Refer to Chapter 5: 5.2.5 Content

(table continues)

The elements used for the feedback process	How the elements were embedded in the feedback process
Dialogic feedback cycle, Beaumont, O'Doherty and Shannon (2008) • Iterative cycle in the feedback process • Adopting the three stages in the feedback process:- - Preparatory guidance stage - In-task guidance stage - Performance feedback stage	Refer to Chapter 3: 3.2 Design of the assignments; 3.3 Provision of assistance for students' performance in the course; 3.4 The use of technology to execute the assignment and facilitate feedback
Dimensions of formative feedback and assessment, Hatzipanagos and Warbuton (2009) • The following dimensions and its descriptors are applied in designing and developing the strategies in sustaining feedback throughout the course. - Power - Dialogue - Timeliness - Appropriateness - Action - Community - Reflection	Refer to Chapter 3: Applied in the guidelines (refer to Table 6)

2.2.2 Strategies to sustain feedback

The common thread with these five models / framework is the social component.

> *"Effective feedback must be seen as part of an ongoing socially-embedded process rather than a one-off product; and engagement with feedback needs to be supported to reinforce that process." (Price, Handley & Millar, 2011, pp.894)*

The social theme has been frequently recognized as an important element in improving the quality of interaction for feedback on learning. Studies have revealed that the social element such as dialogue between lecturers or tutors and students, peer feedback and collaborative works, does provide a vehicle for undertaking feedback activities. Students' engagement in the process has been identified as one of the contributing factors for sustaining feedback. For instance, Taras (2003) revealed that productive and positive learning occurs by providing students with the opportunity to participate and engage with the process of finding their own formative feedback, which they themselves could verify. Similarly, Orsmond, Merry and Callaghan (2004) reported that actively engaging students in a formative assessment exercise centred on a marking criteria results in students being able to both construct and interpret detailed marking criteria and to grade assignments accurately compared to having it done by tutors.

Several papers have indicated that teacher and peer dialogue is one of the strategies for good feedback practice. Higgins et al (2001) found that dialogue types such as negotiation, clarification, and discussion between the tutor and student can prepare students with a better appreciation of what is expected of them, and develop their comprehension of suitable practices and academic terms before or when they start to write. Furthermore, Bloxham and Campbell (2010) believed when dialogue were

increased among tutor and student, this would tilt the balance of responsibility in assessment. The move would turned the learner the existing passive and powerless role in the feedback process to the role in which the learner could hold some responsibility for their interaction with the accessor. Price, Handley and Miller (2011) revealed that immersing dialogue in the feedback process would create the following environment: "The students would be able to understand and use complex feedback designed to support their learning, with the wider aim of developing their self-evaluative skills, so they can reduce their reliance on the judgement of others, as well as developing their self-regulating skills and pedagogic literacy, including the ability to seek advice and ask questions where appropriate." They also illustrated that efficient feedback must be integrated as part of an ongoing socially-embedded process rather than a separate entity; and it is imperative that feedback with engagement needs to be backed-up to consolidate that process. As a result, this concept is embedded in this study via the assignments. (A detailed explanation on this move can be read in Chapter Three)

It is also increasingly evident that peer feedback plays a significant role in sustaining the feedback process. Despite that, there are only several papers which mention good practice for peer feedback. Liu and Carless (2006) proposed embedding peer feedback to engage students embedding peer feedback. In their study, quality of peer marking were awarded with marks. The implementation of this step would provide the motivation for the students to ponder carefully about the assessment criteria and be "engaged" in the feedback process. Nonetheless, they found out that students do attempt to engage with peer feedback because students do recognise the advantages brought by peer feedback for their own learning development (Bloxham & West, 2004).

There were other strategies which advocate the mentioned social elements. For example, Carless (2002) proposed the concept of a 'mini-viva' which was a shorter and

simplified version of the viva voce examination undertaken by doctoral candidates. According to Carless, the idea for a mini-viva was prompted by the purpose to provide an opportunity for timely feedback for the purpose of enhanced learning before a mark was awarded. The design of mini-viva was therefore to provide prompt verbal feedback on the assignment, after its completion but before a mark was awarded. Awarding mark is positioned at the end of the process because it may be proven to be counterproductive for formative purposes (Sadler, 1989) Peer feedback was applied during the mini viva sessions. Peer feedback was seen as the appropriate method for this situation as it had the ability to clear the students' doubts on certain assignment related issues.

Besides that, the practice in giving peer feedback has also been paired with other methods such as the use of exemplars, workshops and group discussions. These three platforms allowed the students to have an opportunity to engage with the assessment criteria and to discuss with tutors why and how these are applied (see for examples Harrington et al. 2006; Hendry, Bromberger & Armstrong, 2011; Price & O'Donovan, 2006; Rust, Price & O'Donovan, 2003; McDowell, Sambell & Sambell, 2006). The mentioned studies illustrate that peer feedback can be effectively utilised via the suggested environment.

2.2.3 Technology integration in the feedback process

ICT has been identified as one of the contributing factors towards feedback (Elliott, 2007). A number of studies offered recommendations about how the technology tools can be used to address the gaps occurring during the feedback process.

For instance, Case (2007) created an electronic template feedback form which explicitly assimilate the assessment criteria pertinent to every student's grade. It was presented in a table form as the main feedback element, expanded by a series of specific statements extracted from a pre-formulated statement bank. This archive of

(electronically-stored) statements was chosen as the groundwork of the more specific feedback. This was done to save effort and time from reiterating comments on scripts in regards to common student weaknesses. Evidence from this study has suggested that students approved this mechanistic approach as it gave them a substantial amount of information on performance. For this matter, it is directly appropriate to assessment criteria and learning outcomes.

Parkin, Hepplestone, Holden, Irwin and Thorpe (2011) highlighted on the availability of feedback stored online for future reference. This presents the greatest opportunity for future learning. The flexibility afforded by having the feedback published online gave the students to read and reply to feedback when they were emotionally ready and in privacy. At the same time, it also enabled them to keep their feedback with the rest of their online learning materials and activities. Unlike hard copy feedback, the students were most likely to go back to the previous given feedback when completing future assignments. In this research, it is believed that this method is one of the many strategies in sustaining feedback within TILE.

A study by Shirley and Irving (2015) illustrated that their specific type of connected classroom technology, called TI-Navigator system was able to promote implementation of instructional tasks pertaining to formative feedback. On one note, studies from Case (2007), and Shirley and Irving (2015) may not be feasible to this study as the digital tools used were systems created specifically and therefore, cost was involved in the creation. These tools were not created from open-source digital tools. Moreover, these created tools do not have limitations unlike open-source digital tools.

Another ICT infused strategy for sustaining feedback would be feedback presented in the form of auditory element which is also known as podcast. This method is frequently utilised in combination with other types of feedback. Studies have revealed that those

who use podcasts to provide feedback find them an informal method which can be used to provide a good deal of feedback quickly, rather as they would in a face-to-face meeting with a student. For example, France and Wheeler's (2007) study on podcasting assignment feedback (PAF) proposed that the application of PAF provided improved opportunities to convey either generic and / or individualised feedback to students. Prior to this, student learning experience would be improved. Ice, Curtis, Philips and Well (2007) have shown that audio feedback could intensify both the instructor's capacity and the sense of community and to influence is a more personalized communication with students. It was also discovered that feedback delivered in audio format was richer in details and more authentic (King, Mcgugan & Bunyon, 2008; Lunt & Curran, 2010). As a result, it helped the students towards a better understanding of the discipline.

Unfortunately, the literature is very confined in the scope of technology application to support and enhance feedback processes and practices (e.g. delivery, publication, production and students' application of feedback via technology) (Parkin et al., 2011).

> *"Using technology to enhance the educational process involves more than just learning how to use a specific piece of hardware and software. It requires an understanding of pedagogical principles that are specific to the use of technology in an instructional setting." (Diaz & Bontembal, 2000, pp.1)*

In TILE, formative assessment encompasses distinct characteristics as compared to face-to-face contexts particularly due to the asynchronous nature of interactivity among the online participants (the teacher and learners) Vonderwell, Liang, and Alderman (2007) as cited in Gikandi, Morrow and Davis (2011). It follows that educators need to develop pedagogy for this type of learning environment to achieve effective formative

assessment strategies which are able to back-up deep learning or higher-order thinking and its assessment (Gikandi et al, 2011).

2.3 Part II: Theoretical framework: Towards a conceptual framework

As discussed and illustrated in Part I, the key-element used in sustaining feedback is the social theory. For that reason, this research is grounded within the theoretical framework of social constructivism.

The constructivist theory of knowledge brings forth the belief that learners do not duplicate or immerse ideas from the external world; instead, the learners have to create and develop their concepts via personal and active analysis and inspection (Piaget, 1970). A report by JISC (2004) outlines the constructivist principles in learning:

- The learner actively constructs knowledge, through achieving understanding
- Learning depends on what we already know, or what we can already do
- Learning is self-regulated
- Learning is goal-oriented
- Learning is cumulative

There is a large volume of published studies believes that learning is no more an individual process. Studies have further described an engaged and vibrant learning occurs within a knowledge community. Such circumstance is known as social constructivism.

> *"Every function in the child's cultural development appears twice: first, on the social level and, later on, on the individual level; first, between people (interpsychological) and then inside the child (intrapsychological). This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher*

functions originate as actual relationships between individuals."

(Vygotsky, 1978, pp.57)

Social constructivism, a theory developed by Lev Vygotsky, is a type of cognitive constructivism. Within the social constructivist learning environment, the learner is given the time to talk while the teacher plays the role of a listener, observer and comes to aid according to the condition. Social constructivism thrives in these two closely related elements; learning communities and Zone of Proximal Development (ZPD). As for feedback, social constructivist interaction is essential for feedback (Johnson & Black, 2012) to ensure the feedback process is sustained. Furthermore, social constructivist has to be immersed in the learning environment to stimulate the feedback process. A considerable amount of literature has been published on the relationship between these elements of social constructivism and feedback.

2.3.1 Learning communities

This concept is quickly gaining the interest of many because it fits well with the changing philosophy of learning, and literature has proven that it works (Cross, 1998). In other words, the learning community is the foundation to a successful education (Clark, 1998). Bruner as cited in Clark (1998) describes the "community of learners" as a group of learners who emulates methods of knowing or doing, offers non-stop commentaries, produces chances for emulation, supplies "scaffolding" for novices, and also contributes better context for teaching intentionally. Prior to that, Clark (1998) describes five characteristics for this element.

- The learners must come to know one another. A community of stranger is a contradiction.
- All members of the learning community must share the common purpose of learning

- Learning in community is an active process in which each member is actively engaged in either group or individual projects in support to both the learner and the group's learning

- Learning opportunities and activities within learning community are of real value to themselves and ideally to others as well.

- A sustainable learning community is a pleasant place to be.

Within the learning communities, the teacher's role is not reduced. Instead, the teacher plays an extra role of inspiring learners to spread around their new-found knowledge (Bruner, 1996). Learning communities was first initialized when Rogers (1969) wanted to set-up a 'community of learners', whom were free to seek ideas which have intense personal meaning and these seeking of idea process excite them. He strived, above all,

> *"...to free curiosity; to permit individuals to go charging off in new directions dictated by their own interests; to unleash a sense of inquiry; to open everything to questioning and exploration; to recognise that everything is in process of change... [And] the facilitation of (such) significant learning rests upon certain attitudinal qualities which exist in the personal relationship between the facilitator and the learner (pp.105-106)."*

For Rogers, he quoted that these qualities were 'realness' (the teacher illustrates authentic feelings such as sympathy, interest, or boredom), 'prizing, acceptance, trust' (in regards to student's intellectual and personal qualities), and 'empathetic understanding' (the skill to empathize how learning is according to the student). Piaget (1976) and his perception of active learning also acknowledged that students

accomplish better when they ponder together in groups, record their thinking and describe it by presenting to the class. While they actively immersed with their peers to think together, they became more engaged in learning. This was further justified as Vygotsky (1986) introduced the notion that "learning is a social experience". When individuals thinking alone, personal meaning was conceived first. Next, they tested their thinking in dialogue form with their peers to formulate shared meaning. Finally, they produced collective meaning by critiquing shared meaning in a larger community.

Cross (1998) described that within learning communities, knowledge is not only simply "discovered" but was also socially constructed. As a result, instead of having the facilitator conveying the information, students actively construct and assimilate knowledge through a reciprocal process (Bruffee; Schon; Whipple as cited in Zhao & Kuh, 2004). With this, learning becomes deeper, yet personally relevant. Eventually, learning becomes an integral of the student's very identity, not just as a separate entity which the student has.

Community of learning is then further constructed when Wenger (1998) transcribed his view of this particular learning into a model of apprenticeship and work-related learning, that was developed as a social learning framework to include four components; community, identity, meaning and practice. According to Wenger (1998), *meaning* was described as participation and reification, which was historically and contextually bound, constituting learning from negotiated experience and participation in the community while *practice* was learning by doing, involving participation with the community, with the aim of achieving shared goals. Wenger (1998) defined *identity*, through the use of objects, shapes experiences and contributes to identity formation, with identity seen as learning as becoming. *Community*, described by Wenger (1998), was similar to learning as belonging, where the community was the learning context

with three essential components; mutual engagement, joint enterprise and shared repertoire.

These characteristics are necessary in sustaining the feedback process. Shared objectives and purpose within community of learning will place feedback in an active role. This is because the students in the community of learning will apply iterative feedback to achieve a common goal.

2.3.2 Zone of Proximal Development (ZPD)

> *"…the ZPD is the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers. . . What children can do with the assistance of others might be in some sense even more indicative of their mental development than what they can do alone." (Vygotsky, 1978, pp.34)*

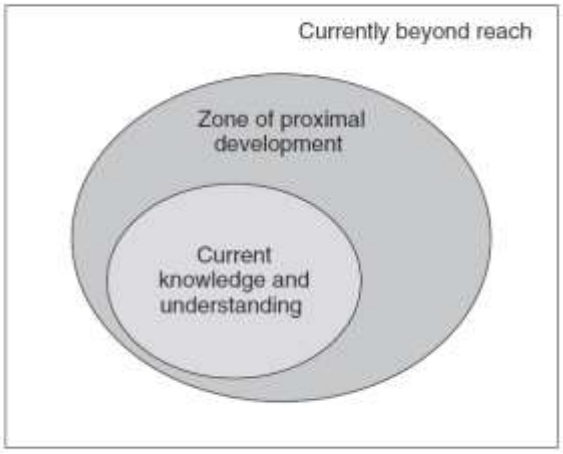


Figure 2.6 Zone of Proximal Development

The notion of ZPD is based on Vygostky's belief that social interaction is an essential element to successful growth on these aspects: cognitive and intellectual. Based on Figure 2.6, the ZPD is an area of cognitive development which is placed between the learner's prior knowledge and understanding and beyond the learner's

current level of understanding. In order for the learners to develop 'progress', they need to be facilitated towards the zone. Successful migration across this zone is very much dependent on social interaction. In this area, therefore, there will be gradual scaffolding for a new skill or task on the learning task either via teacher guidance and/or with peer collaboration until the learner is able to complete the task independently. ZPD also illustrates an importance on the readiness to learn, "where upper boundaries are seen not as immutable but as constantly changing with the learner's increasing independent competence at each successive level" (Brown et al, cited in Ash and Levitt, 2003). In short, the progress across a ZPD is the axis to learning (Vygotsky, 1978).

Such occurrence in the space is also known as scaffolding. Social constructivists see learning as dual-agentic in which both teacher and learner engage to co-construct the socio-cultural realm (Adam, 2006). The scaffold will then be the joint decisions made by the teacher and learner (Silcock, 2003). Several studies have shared similar views on scaffolding. Roehler and Cantlon (1997) identified scaffolding as "the social interaction among students and teachers that preceded internalization of the knowledge, skills and dispositions deemed valuable and useful for the learners". Davis and Miyake (2004) interpreted the process as assistance without which a learner cannot accomplish a goal or engage in an activity. Kim and Hannafin (2011) distinguished scaffolding as a help-line provided by the more capable to assist struggling learners to achieve what they cannot accomplish independently.

2.3.3 The relationship between social constructivist and feedback

The essence of social constructivist namely ZPD in the feedback process can be seen as early as in the 1980s. Sadler (1989) suggested a form of scaffold such as a guided yet direct and authentic evaluative experience should be given to the students in order for them to develop their evaluative knowledge. This in turn stimulates the feedback

process. At the same time, Sadler added that it also enables transfer of some of the responsibility on making evaluative decisions from the teacher to student. In this way, students are gradually exposed to the full set of criteria and the rules for using them, and so build up a body of evaluative knowledge. As the students receive such evaluative experience, it also makes them aware of the difficulties which even teachers face of making such assessments. With that, the students become insiders rather than consumers. Ergo, this transfer of roles ensures the feedback process is sustained.

A more recent study by Ash and Levitt (2003) revealed the application of ZPD in the iterative process of formative assessment. Ash and Levitt described the cyclic determination of irregularities between teacher and student's understanding can be illustrated as an ongoing analysis of the distance between the learner's current and likely tiers of ability in the ZPD. According to Ash and Levitt (2003), the core of this argument comprised iterative use and cyclic appropriation of another's products. In their analysis on ZPD, Ash and Levitt identified the scope for the teacher and the student. The scope of the teacher includes appropriation of student product such as drawings and questions. On the other hand, the scope for the student comprised of learner appropriation on activities, questions or teacher strategies. Ash and Levitt further explained the mechanics behind ZPD (refer Figure 2.7).

In their own words: '*the teacher collects evidence of learner understanding, she appropriates products that reveal needs and strengths. In order to interpret the evidence, the teacher compares her original expectations against the actual performance of the learner. In order to assess evidence for understanding and act on that knowledge, the teacher must appropriate the student's understanding into her own system of understanding, compare the two understandings, and then decide how to guide the student within the ZPD.*'

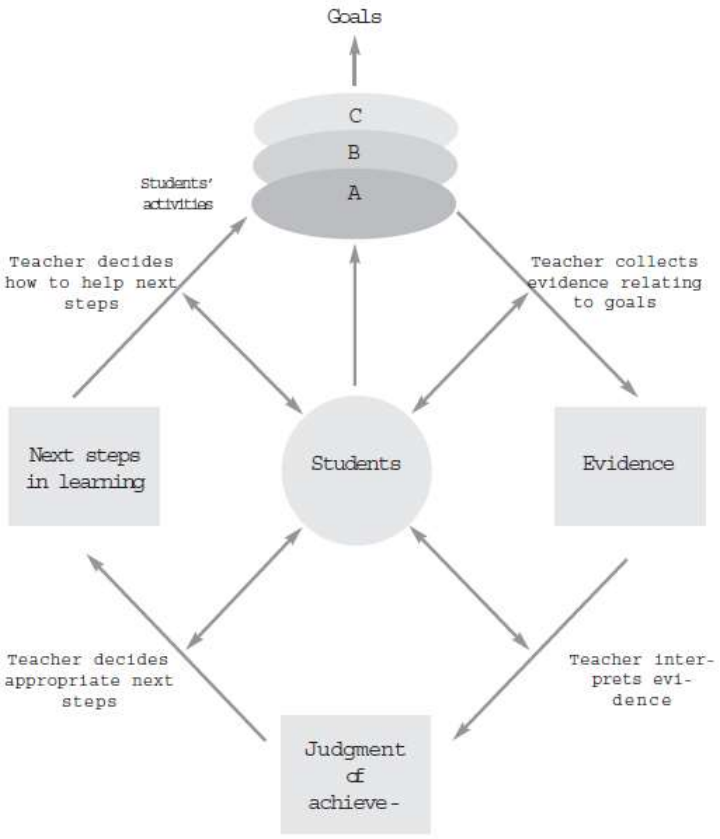


Figure 2.7 Formative Assessment Cycle (Ash & Levitt, 2003)

Sustaining the feedback process occurs within an active ZPD. An active ZPD requires the characteristic of being dialogic. Higgins et. al. (2001) pointed to effective feedback being feed-forward which is equivalent to being "*dialogical and ongoing*". In their study, "*dialogical and ongoing*" methods such as discussion, clarification and negotiation between student and tutor can equip students with a better appreciation of what is expected of them, and develop their understandings of academic terms and appropriate practices before or as they *begin* to write. Gravett and Peterson (2002) described dialogue as an entity of relationships in which participants thought and reasoned together. Several studies have revealed that dialogue is a useful tool for reconciling the different perceptions of teachers and students of the feedback process (Adcroft; Carless; Maclellan as cited in Yang & Carless, 2012). According to Nicol (2006) feedback in a dialogue form which provided the path for the students to engage with the teacher in discussion of the received feedback. Nicol (2006) further explained

that discussions with the teacher assist students to build their understanding of expectations and standards, to check out and correct misunderstandings and to get an instant response to difficulties. Elsewhere, Yang and Carless (2012) argued that it was necessary to nurture collaborative and mutually trusting teacher-student in order to sustain feedback. It is also revealed that feedback in its most productive forms was experienced as a social and relational process in which dialogic interaction within a trusting atmosphere could help to promote learner agency and self-regulation (Yang & Carless, 2012).

Learning communities is essential to the feedback process. Students and their peers are the force in learning communities. Boud et al. (1999) defined peer learning as the application of teaching and learning approaches whereby students learn with and from their peers without the immediate intervention from the teacher. Peers provide plentiful information which, subsequently, could be applied by individuals to conceive their own self-assessments (Boud, 1995) and follow up with actions to enhance their project (Liu & Carless, 2006). Evidently, peer learning encourages vital learning which includes exchange of teaching and learning from the students with their peers (Keppell et al., 2006). Peer learning have been identified as one of the contributing factors towards a sustainable and stimulating feedback. This learning method amplifies an impression of self-control on among learners such as (1) revealing learners not only to replace perspectives on issues but also to replace methods and approaches (2) developing a judgement that is detached which is shifted to the assessment of their own work (Nicol & Dick, 2006).

A form of peer learning in the feedback process is peer feedback. Hyland and Hyland (2006) defined peer feedback as a formative developmental process which provides the students the opportunity to discuss and discover diverse interpretations of their written

texts. A study by Falchikov (2001) had shown that peer feedback plays a prominent role in learning because it enables students to a better self-assessment (Liu & Carless, 2006). Peer feedback should be capitalized as (1) students received more feedback from peers and more quickly in comparison to receiving feedback from lecturers (Gibbs, 1999, Liu & Carless, 2006). At the same time, peer feedback should be capitalised on when mass Higher Education is experiencing continuous increase of resource constraints and a decreasing capacity among lecturers in providing sufficient feedback (Liu & Carless, 2006) and diversification of the student population and a decrease in individualised tuition (Nicol, 2010).

2.3.4 Social constructivist and technology integrated learning environment (TILE)

Research findings by JISC (2009) reported that in the 21st century learners with their technology-enabled lifestyles ensure that learning was accessible via their own personal choice of tools, ranging from MP3 players, smart phones, and handheld games consoles, to free online chat, and social networking sites. For that reason, it is of utmost necessity for the practitioners to embrace the fact that these informal yet personal technologies hold a significant role in learners' learning approaches.

Nonetheless, technology integration does not isolate technical artifacts of various software devices and computer hardware during the teaching and learning process. In fact, technology integration should include the selection of theories in setting the instructional strategies for appropriate immersion of technology-mediated activities in learning and teaching (Gray, 2008). The point is illustrated by Okojie, Olinzock and Okgie-Boulder (2006):

> *"Technology integration should include the strategies for selecting the desired technologies, skill to demonstrate how the selected technologies will be used, skill to evaluate such technologies, as well as the skill to customize the use of such technological skills in a way that addresses instructional problems."(pp. 66)*

Thus, the key picture that emerges is that students are appropriating technologies to meet their own personal, individual needs – mixing use of general ICT tools and resources, with the official course or institutional tools and resources.

Previous research findings reveal evidence of elements of social learning theory such as social networking, peer support and peer community, inspires and adds value to the learning within TILE. Research studies by Leidner and Jarvenpaa, 1995; and Webster and Hackley, 1997 (both cited in Hrastinski, 2009) argue that online learning was best accomplished when learners participate and collaborate. Herrington and Oliver (2000) found that ICT tools support and improve learning by providing endless opportunities for both students and lecturers to communicate, share and engage in collaborative assignments based on the social constructivist learning theory. Woo and Reeves (2007) pointed out that Internet communication tools, such as e-mail, and online forum, gave learners the opportunities to contribute to discussions and exchange information, while providing chances for learners to communicate actively either in one-to-one or in-groups. Subsequently, this creates possible opportunities for collaboration such as team assignments. Prior to that, it had been further recommended by Woo and Reeves to re-envision online interaction in regards to meaningful learning according to the social constructivism learning theory. It had also been suggested that significant interactions within a learning community are prior to interactive collaboration. This is a vital sociocognitive process in online settings which is needed to guide critical thinking

(Akyol, Garrison, & Ozden ; Kehrwald as cited in Gikandi et al. 2011). Similar views are echoed in a study by Crook (2012) which revealed that these possible interpretations of learning categorized as social experience are well advocated by the networking and communication tools which are connected with the current generation of digital technologies.

With that in mind, the following online tools have been used for this study; Learning Management System (LMS) - Moodle, Google Sites, email, and IM tools.

(a) ***Learning Management System (LMS) - Moodle***

> *"... the effectiveness of formative feedback could be maximised if it was communicated to the student's learning space, an environment where all learning material and resources of a particular lesson reside. A Learning Management Systems (LMS) constitutes such an environment. An LMS could be perceived as a student's desktop and thus, it would be more effective if the feedback was delivered on the desktop of the student." (Hatziapostolou, & Paraskakis, 2010, pp.112)*

Dias and Diniz (2014) identified Learning management system (LMS) as a learning space which facilitated learning by offering an anchored location where learning material resides. Both of them further explained that the learning platform also inscribed elements of an interactive learning environment assisted by mediating tools which support, for example, collaboration, communication and sharing information, training amongst the LMS users. These rich, student-centred learning environment were frequently adopted and applied by many higher education institutions (Zouhair, 2012) since these platforms contribute the opportunities to heighten the learning encounters of both on-campus students and those distance-learning students (Hatziapostolou & Paraskakis, 2010).

Hatziapostolou, and Paraskakis (2010) reported that feedback is an instrumental aspect of learning and should, therefore, be integrated in the student's learning space. They explained that LMSs today provide support mainly for the regulation of formative assignments. Hatziapostolou, and Paraskakis mentioned that integrated features such as forum, file management and notifications can support instructors. This is done by enabling the instructors to easily setup assignments and access student submissions while students are guided in the duty of online assignment submission.

Based on the above explanation, LMS was one of the digital technologies adopted for the feedback process. In this study, the chosen LMS was Moodle. Moodle is an acryonm for Modular Object-Oriented Dynamic Learning Environment. It was developed by Martin Dougiamas to assist educators in setting up online courses with the highlights on interaction and collaborative construction of content. At the same time, Moodle is also in continual evolution. In other words, Moodle's major philosophy is social constructivism, the key component in this study.

(b) ***Google Sites***

Google Sites is a part of Google Applications productivity suite. It is a structured wiki-creation. It is also categorised as a web page-creation platform. The Google Applications have the following applications, providing Google Sites robustness. (Farooqui, 2008):-

- Gmail.
- Google Talk.
- Google Calendar.
- Google Docs.
- Youtube & Google Video
- Google Maps

The purpose of Google Sites is for the user to create a team-oriented site where a team of more than two persons are able to share and collaborate files. Google Sites enables any invited user to edit pages. The invited users need not have any knowledge of Web coding or design. Furthermore, information published on the site is searchable by visitors with permission to use the site. Individual teams members can also designed profile pages of their activities, interests and schedules. As for school settings, Google Sites function as virtual classrooms for posting class notes, homework assignments, or other related resources (Auchard, 2008).

Research has shown that Google Sites is able to support social constructivism. A study by Coutinho (2009) revealed that teachers who used Google Sites in their lessons agreed that the learning space can be adopted to various pedagogical contexts: i) for collaborative work; ii) to create class websites, iii) for students to apply as an individual/group e-portfolio; iv) to diffuse classroom work to the educational community, v) to coordinate and share classroom resources. Rodriguez-Donaire and Amante García (2011) identified that Google Sites was seen as a better choice for student's ownership in a collaborative environment. It has also conclusively been shown that Google Sites is created to permit group work and collaboration in an open and distributed manner, and is perfect for supporting team work activities (Roodt & de Villiers, 2012).

(c) Email

A considerable amount of literature has been published on applying email as an effective teaching and learning tool. Debard and Guidara (2000) identified email as the origin of more intensive student interaction which generate to more active, in-depth, and a more engaged learning experience. On a similar note, a study by Yu and Yu (2002) had shown empirical evidence recognising the efficiency of e-mail as a potential tool in encouraging students' cognitive growth. This view was supported by Tao and Boulware

(2002) who highlighted that communication via email aids teaching by "identifying instructional focus and taking advantage of instructional moments to fit the developmental needs of their students in authentic situations". In their study, it was also discovered that learners are motivated when received email. Email also creates new learning opportunities while encourages authentic communication. Under these circumstances, email would be of suitable assistance in the feedback process.

Providing feedback via emails provide the opportunity of being prompt and immediate, as this tool allows teachers to send individualized feedback to each student in a timely manner (Cascio & Gasker, 2001; Cifuentes & Shih, 2001; Cook-Sather & Mawr, 2007; Davenport, 2006; Grünberg & Armellini, 2004; Zhu, 2012). A large trial scale study conducted by Carswell, Peter, Price and Richards as cited in Huett (2004) whom the samples – students, were only taught using electronic communication also reached similar conclusions: more immediate feedback; quicker assignment return; well-made model for queries, with better perceived reliability; increased interaction with students and tutors; extending learning experiences such as problem-sharing with other students. All these occurred beyond the classroom wall. On that account, email provides the opportunity for improved communication while assisting the students with plenty of chances to put forth questions to their instructors of which is crucial in sustaining feedback (Vonderwell, 2003).

(d) ***Instant Messaging (IM)***

Instant messaging (IM) is a form of computer "chat" that allows one to have a real time, typed "conversation" with one or more "buddies" while connected to the Internet (O'Conner, 2005). A window is dedicated to the conversation, with messages scrolling upward and eventually out of view as the conversation ensues (Grinter & Palen, 2002). IM also supports group chat, with the users inviting others to join them in a specified

"room." Other functions which IM supports are personalizing color and fonts, embedding images and sharing URLs in the message. Examples of IM are Yahoo Chat, Google Talk, MSN Messenger and Facebook Messenger. These different IM tools are merged or integrated into hybrid environments. Google Talk for example, can be accessed using a mobile phone or through email such as Gmail while Facebook Messenger can also be assessed via mobile phone or Facebook site. Grinter and Palen (2002) found out that IM is the preferred tool for socializing among teenagers and young adults. IM is now widespread amongst undergraduate students (Jones, Ramanau, Cross, & Healing; Judd & Kennedy; Smith, Salaway, & Borreson Caruso as cited in Timmis, 2012).

Several studies have revealed that IM is able to enhance the learning experience. For example, there is evidence suggesting that IM is able to act as a medium for coordination with the consequent increment in productivity (Grinter & Palen; Isaacs, Walendowski, & Ranganthan; Nardi, Whittaker, & Bradner as cited in Contreras-Castillo, Pérez-Fragoso & Favela, 2006). It has also been suggested that IM was seen as a less formal tool, and, as a result, providing a kind of closeness among the users (Hu, Fowler Wood, Smith, & Westbrook, 2004; Lovejoy & Grudin, 2003). IM had also been perceived to support complex activities such as social learning (Isaacs et al., 2002). In addition, a study by Nicholson (2002) revealed that students who are IM users, have a healthier sense of community in comparison to those who do not, and that these students applied IM to converse issues in regards to the subjects. This is because it cultivates the perception of awareness and identification which personifies the social dynamics of a local society (Dugénie, Lemoisson, Jonquet, Crubézy, & Laurenco, 2006). Based on the above findings, IM tool was chosen to be part of the feedback process.

2.4 Summary

The literature relating to strategies in sustaining feedback shows that there is the potential for this study to add to the body of existing knowledge by offering alternatives in a technology integrated learning environment. The social constructivist framework was then proposed as the conceptual base for the prescribed strategies in sustaining feedback in a technology integrated learning environment.

CHAPTER 3: DESIGN OF FEEDBACK PROCESS IN TILE

3.1 Introduction

Once the characteristics for sustaining feedback were acknowledged, the next stage was to develop the strategies which incorporated the critical elements. All the characteristics identified in Chapter Two were assimilated into the course, so that the strategies could be properly investigated. The aspects of the course which received the integration of the characteristics were: the design of the assignments; implementation of the assignments; provision of assistance for students' performance in the course, and the use of technology to execute the assignment and facilitate feedback.

3.2 The design of the assignments

Knight (2002) described assessment as the "Achilles heel of quality". Assessment is for learning and learning is at the core of the higher education goals (Dearing; Garrick as cited in Craddock & Mathias, 2009). As such, assessment for learning addresses certain functions that it has been called on to perform in higher education (Joughin, 2004). Assessment for learning is commonly referred to practices which are feedback-dependant (Black & William, 1998; Sadler, 1989; Yorke, 2003). For that purpose, assessment for learning should be strategically planned and "suitably" tasked in order to ensure that student learning becomes more efficient (Earl & Katz, 2006; Gibbs, 1999).

For this course, the assignments were designed prior to the components of assessment for learning; tasks that encourage the appropriate learning processes; effective feedback; and students' development of "evaluative expertise" (Joughin, 2004). The nature of the assignments is illustrated in Table 3.1.

Table 3.1

Breakdown of the Assignments

Assignment 1 (A1)	Assignment 2 (A2)	Assignment 3 (A3)
My Google Sites- ePortfolio – ongoing assignment (20%)	Reflection – On-going assignment (20%)	ETOYS Kit with Brennan (20%)
Individual task	Individual task	Group task
Supporting ICT tool- Google Sites	Supporting ICT tool- Google Sites	Supporting ICT tool- Etoys

Since social constructivist was the view for the feedback process, the assignments were designed and mapped out according to one of the chosen models, Torance and Pryor (2001) divergent formative assessment. As mentioned in Chapter 2: Table 2.1 (pg.27), the concept for divergent assessment calls for a more open engagement with what the students can do and holds firm to a more dialogic, conversational form of language during the feedback process. These elements were adopted and embedded in the design of the assignments.

The following describes each assignment.

3.2.1 Assignment 1 (A1) – the ePortfolio

(a) ePortfolio and higher education

> *The ePortfolio is currently defined as "a collection of authentic and diverse evidence, drawn from a larger archive representing what a person or organization has learned over time on which the person or organization has reflected, and designed for presentation to one or more audiences for a particular rhetorical purpose"*

(ePortfolio Portal, 2004 taken from National Learning Infrastructure Initiative, 2004)

ePortfolio is known to be the learning space for the learners. It is a platform for the learners to create products which include collection of digital artefacts articulating learning (both formal and informal), experiences and achievements. Learners use the provided ePortfolio tools to develop ePortfolios for the course. During this production process, learners can be fundamentally supported to develop one or more skills such as collecting, selecting, reflecting, sharing, collaborating, annotating and presenting which can be interpreted as e-portfolio-related **processes** (Becta, 2006). Therefore, the ePortfolio is crucial for the students' development because it has the capacity to be a learning tool, an assessment tool, and a record of achievement (Barker, 2005).

ePortfolios are being integrated quickly into higher education (Ritzhaupt, Singh, Seyferth & Dedrick, 2008; Zubizarreta, 2009). Batson (2002) has put forward that ePortfolios have a greater potential to change higher education at its very core than any other technology application. Moreover, university graduates are expected to have 'higher' order abilities, and be independent learners. According to Trevitt, Macduff and Steed (2013), ePortfolio was able to assist in churning such graduates. This is because ePortfolio has proven to offer richer, transformative educational experience for the students (O'Keeffe & Donnelly, 2013). Previous studies have also reported that ePortfolios played a crucial role in online learning assessment (Black & William, 1998; Gordin et al 2004; Nicol & Milligan, 2006; Van Tartwijk & Driessen, 2009).

Based on the reported studies, ePortfolio has clearly shown, for online feedback, to have the potential to support learners to capture, collate and reflect on feedback (Murray, Peacock, & Scott, 2011). This is also acknowledged by Gray (2008) which interpret the ePortfolio as a mechanism for assessment, and feedback. Based on these affirmation, ePortfolio was chosen as one of the assignments for the course.

(b) ***ePortfolio the assignment***

For this course assignment, students received a one-page (refer to Appendix A) document that detailed the assignment and grading criteria and suggested potential artifacts. Students were to use Google Sites as the container for the ePortfolio. Google Sites was the choice for the ePortfolio platform because it has the mechanisms such as supports the ability to provide comments and feedback, and space for reflection. In other words, the written feedback would be held within the ePortfolio which was Google Sites (refer to Figure 3.1). The mechanisms in Google Sites allowed the students to have easier access on the written feedback and comments. This provides the students ample of opportunity to use the feedback as a basis for reflection on their level of competency and development.

At the same time, the opportunities for sharing could also support on-going dialogue with peers and tutors/lecturer (refer to Figure 10) from wherever the students may be physically located. On that account, it provides better and sustainable the dialogic interaction, a positive fuel to the feedback culture. Moreover, the students were asked to include their peers' Google Sites in their ePortfolio (refer to Figure 3.2). This action of the students' ePortfolio was 'shared' among their group to cement the social element, the key to sustaining feedback.

The purpose of the ePortfolio assignment was twofold: First, it was to fulfil the following course learning outcomes.

On completion of this course, the students will be able to:

1. *Identify appropriate technology for teaching and learning in the primary school*
2. *Select specific hardware and software for use in the primary classroom*

3. *Integrate and use selected software for teaching and learning in the primary classroom*

Second, the students would develop these transferable skills from the given assignments: *Communication skill, higher order thinking skill, team work, life-long learning, ethical and leadership.*

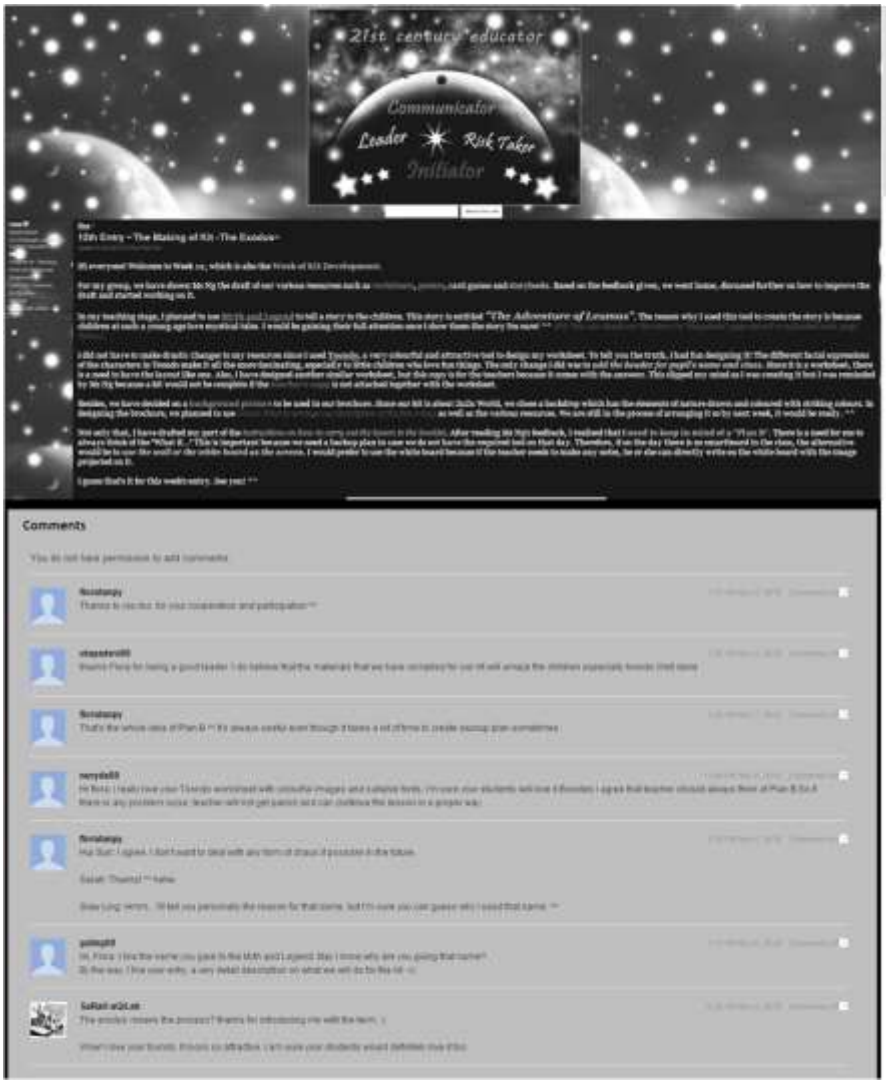


Figure 3.1 Example of a blog entry of a Student's Google Sites ePortfolio together with Feedback Dialogue Between the student and other students/tutor

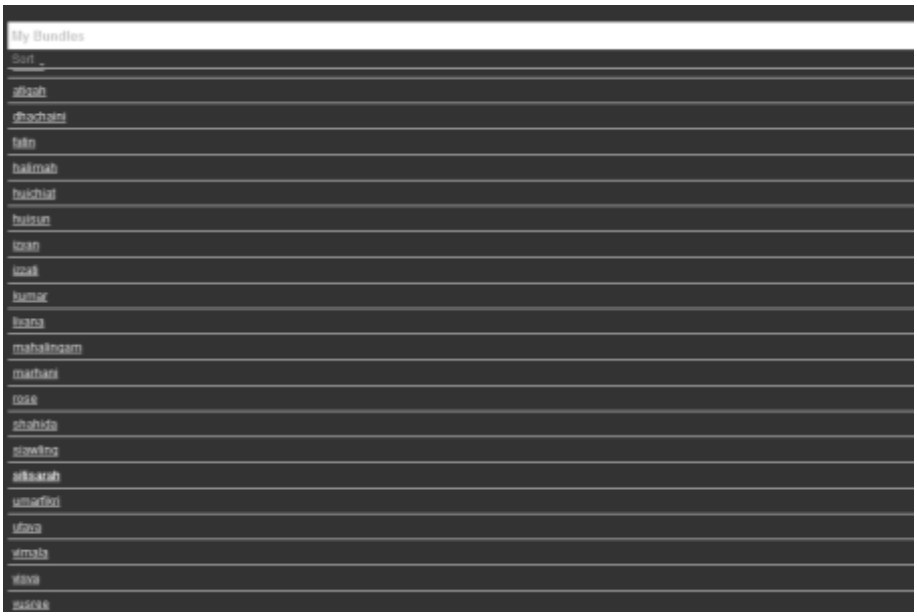


Figure 3.2 The peer community which the student shared their ePortfolio

(c) Guidelines for the eportfolio assignment

The students had to ensure their e-portfolio illustrate the following four elements; **Element 1**: About oneself, and their philosophy as the 21st century educator (refer to Figure 3.3 and 3.4):

An ePortfolio represents the learner as it displays the individuality from each student. It also marks the learner's progressive journey towards his/her mentioned goals. In respect to that, it is significant to include their philosophy. The philosophy is in regards to being the 21st century educator. Bart (2009) believed that proclaiming philosophy of teaching and learning served two main purposes:

1. It presented a capsule summary of the teacher understanding of the value and purpose of teaching and learning to current and prospective employers, students, and colleagues.
2. It encouraged deep self-reflection that in turn enhances the ability to contribute positively to their learning community.

This particular philosophy shapes the learning and their approach on learning for each individual as they prepared their pursuit to become teachers. It follows that this item was very crucial in providing the basic essence for setting-up the ePortfolio. Under these circumstances, it was compulsory for the student to complete this item during the first week of class before starting the other following three items:- (1) reflection, (2) personal knowledge (3) management and demonstrate competency in learning.

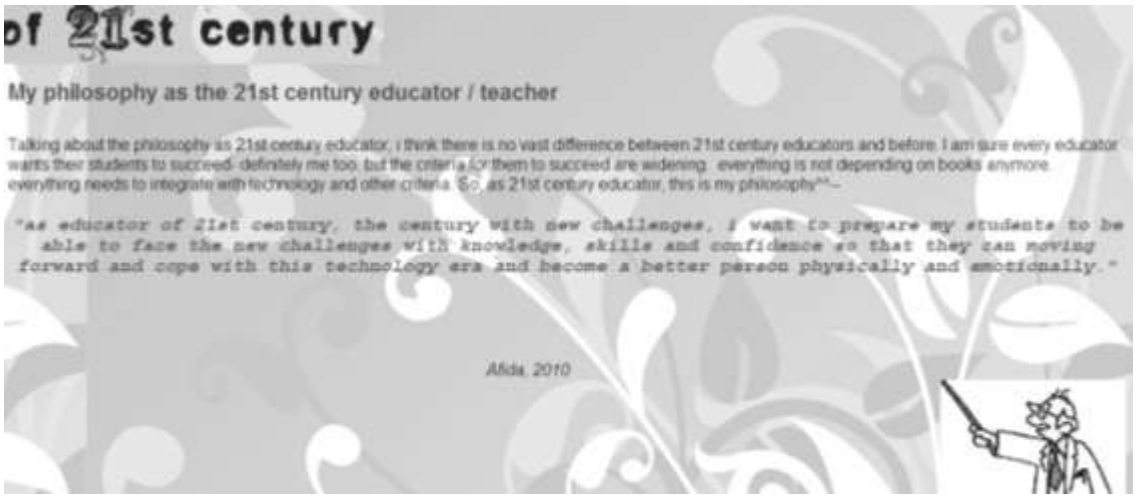


Figure 3.3 Sample of a student A's philosophy as the 21st century educator

The other three items, which were mentioned earlier, filled the learning space. These items were continuously added-on throughout the semester.

My philosophy as 21st century teacher

My Philosophy as 21st century teacher

This was the third time I was editing my philosophy as a 21st century teacher. It happened to me because the moment I read the two previous philosophies I had found out that myself was so schematic. I had included all the academic terms which were related to technology so that I could sound more like a professional 21st century teacher. But honestly, it did not portray what I want to be as a 21st century teacher.

First of all, in my opinion, a 21st century teacher should have a strong passion in teaching. Passion was essential in a teaching profession because it was a job that you would need to deal with until the day you were retired, 56 years old. I believed that a teacher who did not have desire in teaching would only ruin pupils' future. As a future teacher, I always bared in mind that pupils were just like a white piece of paper and I was the ones who could make their life to be colourful. For example, I was so impressed by a teacher during my SEP because she was willing to cut, paste and colour all the teaching aids by herself even though there were so many sets of teaching aids. She told me that she was willing to do anything as long as the pupils understood the lesson. This reminded me that in order to be a 21st century teacher, I must be willing to crack my mind and search for new ways of teaching if pupils did not understand the lesson of the day.

Furthermore, I think a 21st century teacher should not be money minded and selfish. I felt so upset with teachers who had a mindset that being a teacher was just because of the secure job and stable salary. It was so pathetic to pupils who had these type of teachers because they would not be able to maximize their learning and unleash their talents. Some of the teachers even thought that it was not their fault if the pupils were weak in learning because pupils should blame on their own abilities. I totally felt that it was unfair to them (pupils). I also believed that no one was 'stupid' in this world and as long the teachers were willing to teach I was sure that pupils would be smart in their study. Teachers who did not take initiative in profession should also quit or else they were killing the pupils' future softly and slowly.

Lastly, a lifelong learning should be an element in a 21st century teacher. I think I should update myself from time to time especially in the latest teaching tools and methods. Although I only had a very shallow knowledge in technology, I would always try my best to learn it. This was because technology would help pupils to expose and explore in their learning. Unintentionally, a fun and exciting atmosphere can be created as well. I think a teacher should also have aims in pursuing to a higher level such as master degree and PHD. This would not only bring benefits myself but also to the nation as I would have more knowledge in dealing and educating the pupils.

Passion + not money minded / selfish + Lifelong learning = 21st century teachers

Figure 3.4. Sample of a student B's philosophy as the 21st century educator

Element 2: Reflection on learning:

Butler (2006) highlighted reflection as the key aspect of an ePortfolio. He explained that the reflection include what the students have learned during the process of developing their ePortfolio. This view is supported by Gray (2008), who quoted “the ePortfolio is the central and common point for the student experience. It is a reflection of the student as a person undergoing continuous personal development, not just a store of evidence." Therefore, the significance essence addressed by these studies clearly indicates that reflection is an item which cannot be separated from ePortfolio. In this portion of Assignment One, the students had to post weekly entries on the topics discussed during the face-to-face class. A more detailed description on this item is explained in 3.3.2. Assignment Two.

Element 3: Personal knowledge management:

Knowledge management is build upon collegial and professional teamwork. Within this teamwork, the team is actively engaging at many organizational stages in sharing with other team players what they know and currently learning (Petrides & Nodine, 2003). Furthermore, Petrides and Nodine (2003) added that these groups set-up three elements; expertise, trust and relationships. Subsequently, this creates a shared repository of tools, and resources which promotes future learning. In the context of ePortfolio, knowledge management would be interpreted as a digitally developed and managed archive of achieved knowledge and competencies (Barker, 2005asses). The word “personal” represents the students’ preference on collating and curating the knowledge in each of their ePortfolio. With these, the student needed to collect, collate, curate and build up relevant artefacts such as videos, web-links, and images, in order to support their intended learning as outlined in the course proforma. Besides that, the learner had to demonstrate how these artefacts were structured and organized to convey and support the related message. This was crucial because there were other peers who

would be learning from them. On that account, it was necessary to manage and assemble the digital documents or media for easier access and comprehension not just for the learner themselves, but for their peers as well.

Element 4: Demonstrate competency in learning (refer to Figure 3.5):

The word "competency" here can be described as the ability to apply the acquired knowledge and skills appropriately in a given situation. The ePortfolio presentations are "assemblies" or "collections" of ePortfolio items made for an aim which is demonstrating competence in a field (Roberts et. at. 2005). Gray (2008) identifies one of the purposes that e-portfolios serve across a lifetime of learning: supporting and evidencing the pursuit and achievement of personal competences. These statements have clearly shown that ePortfolio plays an influential role in this theme. For these reasons, the requirement to "demonstrate competency in learning" was added in the ePortfolio assignment. The written entries and the collected artifacts would exhibit the student's performance in their learning.

Figure 3.5. A sample on an entry which showed the student's progress on Assignment 3

The student's ePortfolio were constantly monitored by the lecturer and the tutors. At the end of the course, the items which would be evaluated were:

1. Selection of relevant artifacts (resources, links e.g. YouTube and other websites and written communication- pdf, doc, ppt) related to the weekly topic and/or course
2. Use of multimedia e.g. photos and videos as a form of support to the subject and/or topic.
3. Their feedback on their friends' digital collection
4. Frequent update on their own digital collection

The objective of the assessment on the four items was to make the students see that ePortfolio should not be merely a platform to store learning artifacts. It had significant functions which went beyond that. Therefore, the assessment made the students aware of the "beyond". The assessment on the item no.1 and no. 2 focuses on how the students identify suitable digital artifacts to be added in the ePortfolio. As for item no.3, the assessment looked into theme of social learning, the stage which had been set for the classroom. The enforced purpose was to create the path for the students to adapt to the peer learning culture. In regards to item no.4, the evaluation focused on the students' consistency in updating their ePortfolio. This is necessary in order to sustain the learning process that occurred in the virtual learning space. Prior to all these "beyond", the students would be able to relate how ePortfolio can be applied effectively in their teaching and learning. This fulfilled the course learning outcomes which were to:-

1. *Identify appropriate technology for teaching and learning in the primary school*
2. *Select specific hardware and software for use in the primary classroom*
3. *Integrate and use selected software for teaching and learning in the primary classroom*

For the ePortfolio assignment, the students were also encouraged to try other modules / widgets / plug-ins which can help enhance and add value to his/her ePortfolio. This is shown in Figure 3.6 and Figure 3.7.

Figure 3.6 Sample One-Examples of plug-ins / widgets used to enhance ePortfolio

Item 1 and Item 2: Glitter type lettering. Plug-ins from http://www.glitx.com/

Item 3: Animated GIF (Graphics Interchange Format) type image

Figure 3.7. Sample Two-Examples of plug-ins / widgets used to enhance ePortfolio

Item 4: Plug-in to stream music

Item 5: The marquee tag is an HTML element which makes the text to move from left to right and up and down. Marquee text plug-in from http://www.marqueetextlive.com/

3.2.2 Assignment 2 (A2) – the reflection

Dewey (1933) argued that reflection on individual experience is critical for enhancing learning and for making meaning from the experience. Quinton and Smallbone (2010) presented reflection as a mental process which incorporates critical thought about an experience and demonstrates learning that can be taken forward. Both researchers further mentioned that students who are reflective, would practice and illustrate transferable self-knowledge. The process adopted a questioning method to themselves, their situation and the roles of others. This was done in order to develop a fresh and contrasting frame of reference. Reflection also gives the student to chance to describe "Aha!" moments that unify practice and knowledge (Karsten, 2012). Furthermore, students are allowed to examine and reflect on their philosophies and practices in regards to the contextual conditions of their specialty, they are more likely to assume themselves the role of active change agents and lifelong learners within their professions (Mezirow as cited in Ryan, 2012). Prior to these beliefs, the students were to write their WEEKLY reflections (Refer to Figure 3.8) in relation to what they were learning about technology in teaching and learning. They could evaluate their own thinking in relation to what they were learning. In addition, they were also to include the progress of their given assignment in their weekly reflection. Each reflection or entry was evaluated (Refer to Appendix B) on the written content.

Posting the entries is not sufficient for learning. Prensky (2005) mentioned that content itself would not help students learn throughout their lives but engagement would. Feedback and feed-forward were subsequently enlisted for that purpose. In order to contain the feedback culture, the entry was also assessed based on the feedback given on their peers' reflection. The students were informed that the type of feedback should not be limited to such "Good writing OR great work OR keep it up etc." Feedback/comments can be questions on the subject mentioned, a disagreement, OR

adding extra information to the current reflection. At the same time, the students had to reply to their peers and tutors / lecturer's feedback. This item was also included in the assessment rubric as to prevent feedback from being passive, linear and static. The objective for assessing the feedback (in terms of quantity and quality) was to ensure every student is involved as an active feedback giver and receiver. The feedback element was graded because the students would need this "motivation" to be involved in the feedback culture.

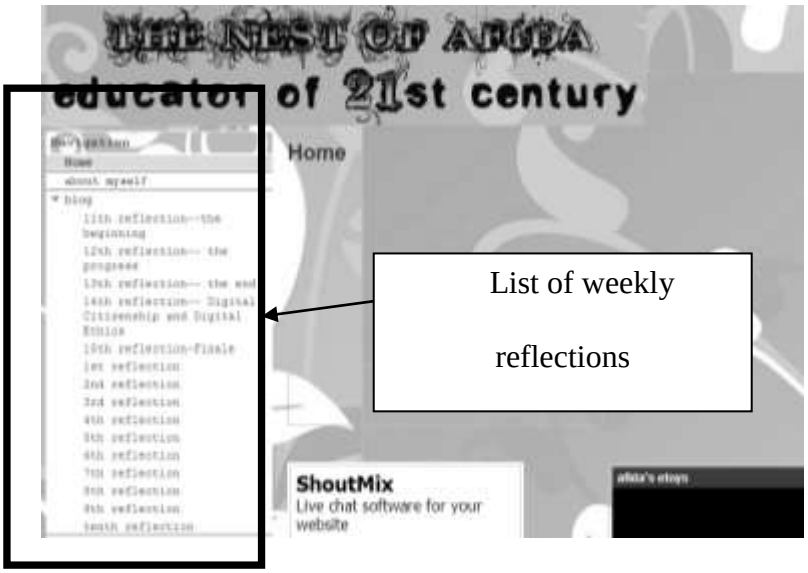


Figure 3.8. Weekly reflections

3.2.3 Assignment 3 (A3) – Project-based Assignment ETOYS

Assignment 3 was a project-based assignment. Project-based learning (PoBL) is applied in higher education because it supports the development of students' capabilities for team work, problem solving and self-regulation (Collis, 1997). PoBL are significant activities in which relevant yet realistic learning occurs from participation in motivating and challenging projects. It consists of apprenticeship and learning and situated learning. Both of these forms deals with real-world issues. Open-ended generative tasks are usually advocated. In other words, there is no prescribed approach. The learners create their own questions, plans and goals. Collaborative decision-making and

problem-solving are vital elements to be included as students work in teams on projects in which they negotiate, consult, collaborate and fix issues to create a product. The students would gain twenty-first century skills such as more inquiring and independent, creative, critical thinking, able to work collaboratively. This was compliant to transferable skills which the course sets to achieve.

PoBL also places the teacher to a different role. The teacher becomes a cognitive coach who models, guides and encourages self-reliance in decision-making and goal-setting (Howard, 2002). The teaching of the module undeniably focused on formal peer learning. When group work or group projects are clearly arranged into courses, formal peer learning occurs. It was also hoped that informal peer learning would occur when students deliberated lectures, and assignments outside the formal class time (Carless & Keppell, 2006).

Assignment 3 was a group assignment. The purpose was to expose students to their peers' viewpoints, teamwork skills, leadership skills, communication, and time management (Johnston & Miles, 2004). Anderson and Boud (1996) argued that within a group setting, 'microclimate of trust which already exists can be established'. The dialogue occurred among the peers in a group is not just ideas being exchanged in a conversation. It is also associates with relationships which the students do think and argue in a cooperative manner (Gravett & Petersen 2002). This was crucial in sustaining feedback among the groups.

The students received a two-page document for this assignment (refer to Appendix C). The project tool for Assignment 3 was ETOYS (Refer to Figure 3.9). ETOYS is a visual programming system and media-rich authoring environment. It is an open-source software programme.

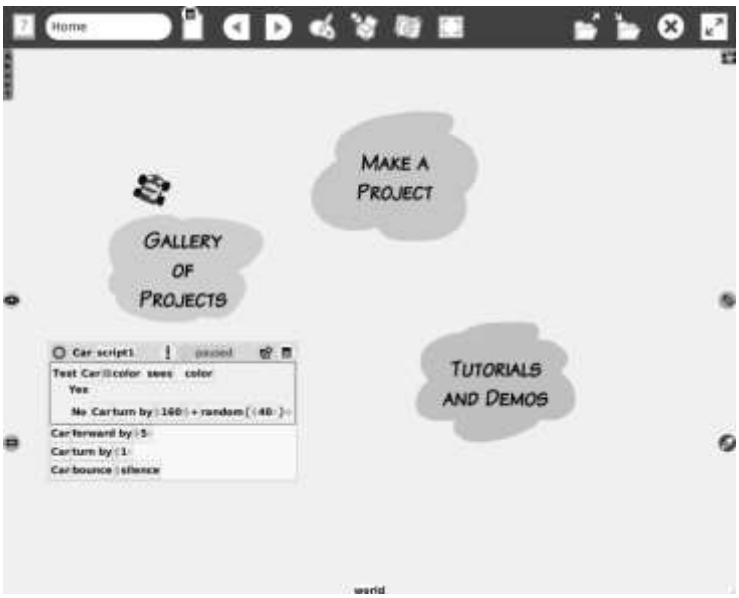


Figure 3.9. The interface for ETOYS

For this assignment, each group was to design and create an ETOYS-package according to the subject of choice (English, Mathematics, or Science). Next, the ETOYS-package would be developed based on one of the chosen principles from the Brennan learning Principles (2002). The main item of the ETOYS - package was the product created from ETOYS. Since the duration of the project was 11-weeks, the group had to decide on what was manageable and reasonable for the ETOYS-made-product. The overall package had to deliver an impactful message. The team needed to think of the problems and issues occurred when these subjects (English, Mathematics, or Science) were being taught in schools. The group would then select the issues which they like to have the ETOYS-made-product as the solution. Every member in the group was to develop his/her own ETOYS-made-product. Next, the group was to create resources/materials to support the ETOYS-made-product. The supporting resources/materials were in other forms such as PowerPoint slides, comic strips, and videos. The students were given several options in creating these items. The options to use tools recommended were online tools such as:

Figure 3.10. Domo Animate

Domo Animate (refer to Figure 3.10) – This free digital tool is a school-friendly version of Go Animate which allows anyone to create animations for free online. One can also add music, sound effects, speech as text bubbles, and interactive elements for story-telling activities.

Figure 3.11. Story Creator from Myths and Legends

Story Creator from Myths and Legends (refer to Figure 3.11) – It is an online cartoon story-creator tool for the myth genre. Story Creator allows the students to use resources such as backgrounds, characters and props to create a graphic version of a story. One's own pictures could also be added to the story.

Figure 3.12. Toondoo

Toondoo (refer to Figure 3.12) – It is an online comic-creating tool. Toondoo has functions which allows fast, and easy way to create cartoons. At the same, it gives the user the opportunity to personalize, and publish his or her cartoons.

Other options would include creating activities via PowerPoint, and Microsoft Words. The students were given the green-light to use different digital tools asides the ones introduced for this project.

3.3 Mapping the assignments

Feedback was established as part of the learning culture in this course. In order to nurture the feedback culture within a technology integrated learning environment, it is necessary to create opportunities for the feedback process. Therefore, the assignments were strategically mapped to allow the students to utilize the opportunities.

According to Cooper (2000), if feedback was to 'work', that is, if students were to learn from it, they need to be given an incentive and the opportunity to use it. For this study, the incentive and the opportunity were injected in these elements (1) the relationship among assignments and (2) the given time frame for the assignments.

3.3.1 Relationship among assignments

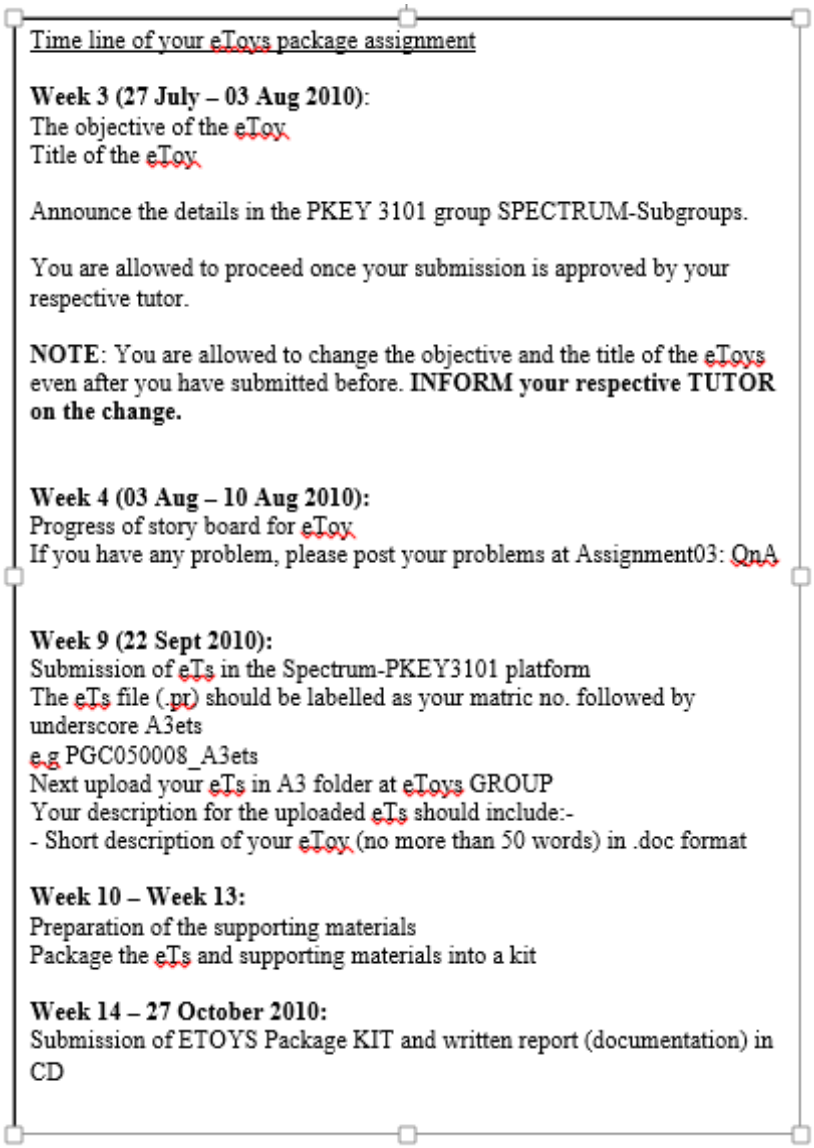
Feedback for given projects or assignments should not function individually. The ties which bind these assignments were crucial in building and sustaining feedback. The relationship here refers to how each assignment is related to one another. This connection enlarges the scope for feedback. In other words, the provided feedback of one assignment will be pertinent to other assignments as well. It complements the feedback loop and turning feedback to feed-forward. For example, the students needed to reflect (A2) on Assignment 3 (A3) in their ePortfolio under the aspect - demonstrate competency in learning. Then, the students would receive feedback from their peers, tutors, and lecturer regarding A3 via the reflective type entries. The students would then be able to utilise the feedback for A3 either to modify or maintain their current development on the A3 product.

3.3.2 Time frame

Time frame includes the following (1) when was the students informed about the assignments, and (2) the duration for each assignment. For the first item, the assignments were given at the beginning of the course-first week of the semester. This was prior to Butler and Winne (1995) concept to provide a firm start in sustaining feedback. This was also to give sufficient time to understand and digest each of the assignments.

Each assignment has its own time frame which gives the students the duration to reflect and process the received feedback for the next step. In Assignment 3, a schedule (refer to Figure 3.13) was drawn for developing the product. As shown in Figure 3.13, there was duration for every step. The duration differed according to the level taken. For example, the submission for the learning objective(s) and title for the ETOYS product, and feedback from the respective tutors and lecturer on these items involved a one-week

time frame. On the other hand, the storyboard and development of the product required a five-week time frame. During the 5-week period, the groups were to consult with the tutors and lecturer about the product creation. Consultation were done during the 3-hour class or other forms of online communication such as e-mail, online-forum at the Moodle platform and chat-tool. The incentive would be the marks for Assignment 3. On that account, the iterative feedback from lecturer, tutors and peers were vital towards developing a "good" product. This situation would contribute towards sustaining feedback.



Time line of your eToys package assignment

Week 3 (27 July – 03 Aug 2010):
The objective of the eToy
Title of the eToy

Announce the details in the PKEY 3101 group SPECTRUM-Subgroups.

You are allowed to proceed once your submission is approved by your respective tutor.

NOTE: You are allowed to change the objective and the title of the eToys even after you have submitted before. **INFORM your respective TUTOR on the change.**

Week 4 (03 Aug – 10 Aug 2010):
Progress of story board for eToy
If you have any problem, please post your problems at Assignment03: QnA

Week 9 (22 Sept 2010):
Submission of eTs in the Spectrum-PKEY3101 platform
The eTs file (.pr) should be labelled as your matric no. followed by underscore A3ets
e.g PGC050008_A3ets
Next upload your eTs in A3 folder at eToys GROUP
Your description for the uploaded eTs should include:-
- Short description of your eToy (no more than 50 words) in .doc format

Week 10 – Week 13:
Preparation of the supporting materials
Package the eTs and supporting materials into a kit

Week 14 – 27 October 2010:
Submission of ETOYS Package KIT and written report (documentation) in CD

Figure 3.13 Schedule for Assignment 3

3.4 Provision of assistance for students' performance in the course

The characteristic of feedback is not merely conformed to the process of students submitting assignments and getting feedback in return. Furthermore, feedback is not solely given by the lecturer. It is believed that the element of "assistance" feedback would be imperative in the feedback process. In this study, assistance works on the following model: Vygotsky's Zone of Proximal Development (ZPD). From this concept, two strategies were involved;-peer feedback, and recap.

It is without a doubt that feedback helmed by the lecturer alone is not only daunting but time consuming. As mentioned earlier in Chapter One, that obstacles can either push feedback away or ranked it to the lowest form within the teaching and learning ecosystem. The students are given the role of co-captains to overcome these hurdles. For this role, the students were coached to give feedback via their assignments. For example, in the giving feedback section for Assignment 2, students were instructed to write feedback which could be seen in these forms (Haines, 2004): rhetorical questions, praise, and descriptive observation. Coaching could be seen when the tutors and lecturer were to model the forms of feedback during the feedback activity in Assignment 2. Next, if there were any students whose feedback fell within these forms, the tutors or lecturer would extract and mention during class time. Another coaching method was telling the students to write one good thing about the reflective entry and one thing which could be improved for the reflective entry.

For example, assistance on how to use the basic features from Google Sites for the ePortfolio assignment since the students were not familiar with the application. Furthermore, this particular assistance ensures every student received the same relevant information. Tips and steps were posted on the LMS forum (refer to Figure 3.14). At the same time, students were encouraged to post questions at the LMS forum if they were

not clear. If there are other students who were able to help, they were encouraged to do so. Same goes to students who found new methods to enhance the product for each assignment.

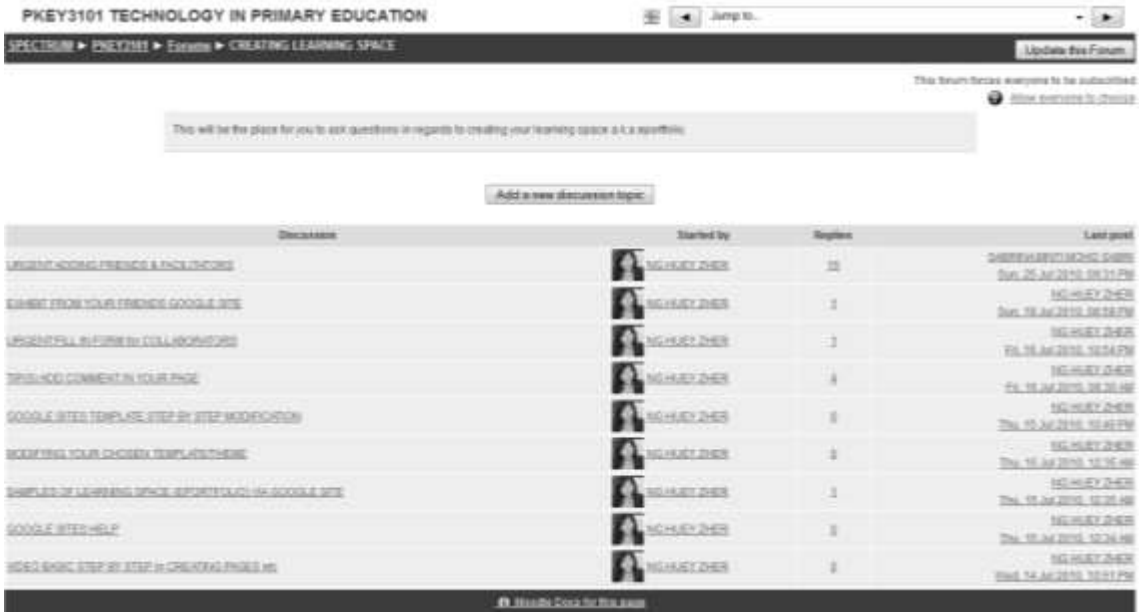


Figure 3.14. Tips and steps on using Google Sites

3.4.1 Peer feedback

Along the line of ZPD, the social learning theory namely the concept of communities of practice was embedded. This is illustrated when the more mature learner experience an enculturation process via specific communities of practices which the learner establishes selected proficiencies in certain fields (Hung, 2002). Because of the large student number, the students were divided into three main groups. Each main group comprised of five smaller five-person teams. This arrangement was applied to Assignment 2 whereby the feedback mechanism on the students' entries was circulated internally of each main group. It was assumed that without this system, students would be favouring their own circle of friends. This was to avoid discrepancy in the giving and receiving feedback. In other words, all the students would not be left behind in the feedback culture. Within these elements, the feedback journey began to form a dynamic structure.

Furthermore, there were class activities which encouraged peer feedback. For example, each group was to present the ETOYS made product during class time. Other groups would be asked to provide their feedback on the presentation according to the given criteria.

3.4.2 Recap

Besides that, another form of feedback known as recap (refer to Appendix D) was also included. The recap was posted on the LMS forum at the end of the day. Recap here refers to reviewing the items mentioned directly or indirectly during class. It also consisted of feedback on the students' responses during class time. When the class broke into two venues, there would be students from both venues asking questions. These feedback type questions from students should be informed to all students and not confined to a specific group. Unfortunately, three hours of class time was not sufficient to provide a summary of the going-ons for that day. The recap provided an opportunity to compile, reorganize and present these questions and answers. Other reasons such as students being restless and tired at the end of the class would disrupt their attention. With the weekly recap, the students would be able to refer during non-class hours and also at their convenience. In other words, the posted weekly recap by the lecturer and tutor ensures feedback was not 'lost'.

3.5 The use of technology to execute the assignment and facilitate feedback.

Opportunity to make feedback "work" was ample due to the digital platforms applied for the assignments. The digital platforms ranged from the tool used for the assignment to tools applied for administering the assignments (refer to Table 3.2).

Table 3.2

Digital Tools Used for the Course

Digital tool	Purpose
Google Sites	Assignments; Eportfolio, Reflection
Moodle Gmail GoogleTalk, Yahoo Chat, MSN Messenger	Administering the assignments/ course

3.5.1 Learning Management System: Moodle

Figure 3.15. Moodle page for the course

Moodle (refer to Figure 3.15) is the official Learning Management System (LMS) for the university. The strength of learning management systems will be the embedded communication tools provided to cultivate and enrich peer learning by providing convenient access to the other students' thoughts (Carless & Keppell, 2006). For this course, Moodle was the virtual classroom. This virtual classroom provided the teacher the convenience to upload the course weekly materials and put-up course-related website links. At the same time, the teacher used this space to publish announcement and debriefing. This platform also allowed the teacher to conduct discussions with the

students via the forum function. On the other hand, the students too, were required to use the forum to post any dilemma as regards to the course assignments.

3.5.2 Webpage: Google Sites

Figure 3.16. Google Sites

This free Web 2.0 application (Refer to Figure 3.16) was chosen for the ePortfolio assignment. The students had the flexibility to manipulate, embed and add file attachments and information from other Google applications such as Google Docs, YouTube, and Picasa to enhance their ePortfolio on their sites. The features from Google Sites such as adding comments and editing contents provided interactivity among students and teacher. This reduced the passive role of feedback.

3.5.3 Email: Gmail

Gmail was selected due to the application for ePortfolio which is Google Sites. Feedback on the entries and newly created pages on Google Sites (ePortfolio) was automatically directed to Gmail. With a standardized email, it was easier to connect with all the students.

3.5.4 Instant Messaging: Yahoo Chat, GoogleTalk, Facebook Chat, MSN Messenger

Figure 3.17. Screenshots of various chat tools used for the study

A research conducted by Richards (2009) clearly illustrated that the immediate response via chat makes it very attractive to learners. This can be said that chat is able to build on the increasing expectations of teachers and students have on e-learning and support. Richards (2009) also wrote that through positive interaction between student and teacher from chat, it can increase the social presence felt between the two parties. Thus, this scenario has the potential to boost class motivation. Hence, besides Googletalk, the students were allowed to use chat tool of their preference. This was because the students have already used certain chat tools before this course. The purpose was also for convenience as the students were able to establish contact wherever they are. As an example in the faculty computer lab, Yahoo Chat was not pre-installed. They had the option to use either Facebook chat or MSN Messenger.

The purpose of the various chat tools (refer to Figure 3.17) was because the need to take into consideration preferences for certain chat tools of the seventy-five students. For example, one particular group preferred MSN messenger, while a majority opted for Yahoo chat. These so-called inclinations began when the students were in secondary school. It was believed it was not appropriate to force the students to change *old-habits* for instance by using just one standard chat-tool for the course. The students had more

options to reach out to the lecturer and the tutors. The issue of feedback lagging would be prevented. With that, the flow of feedback would not be disrupted.

3.6 Guidelines

The design for the feedback process is illustrated in a form of guidelines (refer to Table 3.3), divided into seven components adapted from the Dimensions of formative feedback and assessment (Hatzipanagos & Warburton, 2009).

Table 3.3

Guidelines in Sustaining Feedback

Component	**Description of component**	**Identified strategies on sustaining feedback**
Power	To allocate more responsibility and autonomy in their learning	- Students are given role to provide feedback to their peers
Dialogue	To allow opportunities for peer / tutor dialogue for the purpose of iterative feedback	- Duration within assignments are set to allow students to respond to given feedback - Chosen digital tools to provide condition for peer/tutor dialogue
Delivery (Timeliness)	To provide quick feedback for it to be useful for the students	- Prompt feedback - Constant flow of feedback

(table continues)

Component	Description of component	Identified strategies on sustaining feedback
Content (Appropriateness)	To ensure the feedback content is associated to learning outcomes; and understandable to students	- Feedback content adhere to being constructive, concise, focused and meaningful.
Action	To establish a culture which feedback received by students are acted upon	- Assignments are starting point for the feedback process. - Feedback as an evaluated item in the assignments. - Adding weekly recap as a constant reminder for students on which feedback items need to be given attention to.
Community	To support peer learning	- Create groups and sub-groups (for large classes) which allows iterative feedback among peers.
Reflection	To compare current performance with the expected learning outcomes and take action	- Weekly reflection on their tasks assists the students in digesting and acting upon the received feedback.

3.7 Summary

Once the programme had been designed and developed, and implementation guidelines were identified, the study could be conducted using a resource which incorporated the crucial characteristics of sustaining feedback in a technology integrated learning environment. The methodology for the two parts of the research is discussed in the next chapter.

CHAPTER 4: METHODOLOGY

4.1 Introduction

This chapter describes the research design which consists of rationale and methods. The following section will explain the course in the context of the study. This is then followed by a section on data collection process and method of analysis. Finally, validity and reliability issues are discussed. The research methodology applied attempts to ascertain the following research questions:

1. What instructional strategies will sustain feedback in a technology integrated learning environment (TILE)?
2. What are the challenges which occurred during the feedback implementation in a technology integrated learning environment (TILE)?

4.2 Research design

Black and William (1998) have announced for research which advocates teachers *'in trying to establish new practices in formative assessment*'. There is, subsequently the demand for research on feedback to be ecologically valid. According to Sadler (1998), this was vital because "theoretically or practically desirable practices need to be informed by an adequate conceptualization of what is supposed to go on". Sadler also reminded that over-theorizing the process and build elaborate schemas which neglect the competent practitioners' contributions, it would be precarious. It is also vital to choose a research design which is able to contribute to this real-world practice.

4.2.1 Design and Development Research (DDR)

Design and development research (DDR) was selected as the research design for this project. DDR was defined as "the systematic study of design, development and evaluation processes with the aim of establishing an empirical basis for the creation of instructional and non-instructional products and tools and new or enhanced models that govern their development" (Richey & Klein as cited in Richey and Klein, 2014).

DDR comprised of six major design and development enterprise (Richey & Klein, 2009):- (1) learners and how they learn (2) the context in which learning and performance occur (3) the nature of content and how it is sequenced (4) the instructional strategies and activities employed (5) the media and delivery systems used and (6) the designers themselves and the processes they use. In other words, DDR looked into

- The study of the process and the impact of specific design and development efforts.
- The study of the design and development process as a whole or of particular process components.

DDR was also the preferred research design because it was an applied type of research. Under the category of product and tool research, DDR recognized the influence of the work environments. Furthermore, one cannot ignore that education is a design endeavour (Edelson, 2002).

Edelson (2002) mentioned these exact words: "*if the ultimate goal of educational research is the improvement of the education system, then results that speak directly to the design of activities, materials, and systems would be the most useful result*." He drew the attention to past studies in which the complaints made by the practitioners was the issue of unable to utilise the results of educational research to the problems of

design and implementation. The reason given was that these past studies were not developed towards that aim. As a result, this agenda was important and cannot be ignored because the area of this study required the collection of authentic data in "real-world" settings for contribution to the feedback practice (Black & William, 1998; Sadler, 1998). At the same time, there has been a long call on the question of the effect of educational technology research to delivering to theoretical understanding and/or enriching real world learning and teaching (Reeves, 2006). Similar to research on feedback for teaching and learning, educational technology research requires "real' world" data to provide credibility to the design and implementation. The search for authenticity in the data was what the researcher believed in. The importance of getting answers to real issues, instead in a controlled environment was what the researcher believed would provide better assistance to practitioners.

Consequently, the research methodology for the current study was navigated by the principles of DDR outlined by Richie and Klein (2009).

4.3 Research context

4.3.1 Course context

(a) ***The course***

The course-Technology in Primary Education was a 3 credit hour subject compulsory for Bachelor of Education students at a public university in the Klang Valley. The purpose of this course was to introduce students the concepts of technology and its applications in teaching and learning in primary education. The students also examined aspects of technology used for engaging learners, focusing on information and communication technology, hardware, software, ICT skills, information delivery techniques and integration of teaching and learning. Three assignments were given in order to fulfil the course objectives. The assignments contributed 60% to their final

grade. 40% came from the test conducted at the end of the semester. The course was conducted once a week within a semester of fifteen weeks.

The venue for this subject was the computer lab. Two computer labs were used because the number of computers was not enough to accommodate the large number of students. One computer lab had thirty-five computers. The computer labs were situated next to each other. All the students were gathered in one computer lab for housekeeping, class presentation, and dissemination of the weekly topic. The students were separated into two different labs during group work.

The approach of teaching was blended. Besides meeting face-to-face during the three hours class, the students were to participate in the online forum conducted within the Moodle platform. The assignments were also technology-based. Strategies for implementing the blended learning environment and the execution of the technology based assignments were determined according to the social constructivist approach. The implementation of the strategies were explained in Chapter 3.

(b) ***The students***

The students were teacher trainees for primary school. The seventy-five students (forty-two: male, thirty-three: female), were enrolled in the Bachelor of Education (Teaching English as a Second Language). The program was a collaboration between the university with an institute of education. The students spent four years at the institute before they joined the university. They completed the Diploma and two years degree work at the institute and joined the university to complete their third and fourth year. The students were not familiar with the tools (Google Sites, ETOYS, Moodle) introduced during the course. This information was retrieved on the first class whereby the students were asked if they had any experience using the three tools.

(c) ***The instructors***

One lecturer, assisted by four tutors (including the researcher) managed the subject. The lecturer who had taught the course for several years was the subject matter expert. She contributed to the development of the course design. The three tutors (tutor H, tutor M and tutor R) were enrolled in their Masters in Instructional Technology. Tutor H had 3 year experience of being a tutor for this course while tutor M had helped for a year. On the other hand, tutor R was new to this position.

(d) ***The role of the researcher***

The methodology for design studies such as DDR is highly interventionist in nature (Cobb, Confrey, Lehrer & Schauble, 2003). According to Cobb et al. (2003), design studies are test-beds for innovation. The aim was to examine the prospects for educational improvement by delivering new forms of learning for the purpose of studying them.

"*The classroom as the living laboratory*-Kafai, 2005"

Then, the researcher needs to echo the statement by Kafai (2005). This axiom rings true because the authenticity of the learning environment brings impact towards this study. The researcher will probably unearth the elements which assist to the emergence of the new approaches of learning. Besides that, the researcher will be able identify the relationship occurred among the new forms of learning. On that account, the researcher worked closely with the lecturer in developing and managing the context for the course. Such partnership was also necessary in order to understand the real-world demands placed on designs and on adopters of designs (Design-Based Research Collective, 2003).

Roth (2001) who positioned himself as instructor and researcher, stated:

> *"As a teacher–researcher, I am afforded the unique opportunity of being on the "inside" working with students as they build their scientific explanations and I construct interpretations of what is salient (figure) to them (these are different rather than privileged interpretations). This positioning, my role as teacher, allows me to test my interpretations through continual rearrangements of the learning context in ways that allow me to refine my interpretations. (pp. 34)"*

With the same intentions as the above, the researcher played the tutor role for the course. On account to the given role, the researcher was able to carry out instructional interventions during the course of implementing the designs. These interventions were crucial in identifying and refining the feedback process necessary for the technology integrated learning environment. This was because participative intervention granted the researcher with an opportunity to study the applied feedback strategies in cooperation with the sample target group. It gave the researcher the options to modify and adapt the feedback strategies in line with the context. According to Du Preez, and Roux (2008), due to the flexible, and process-orientated nature of participative intervention research, the participants were able to direct the researcher to their own needs and as well as those who might be introduced to such a learning design in the future. This would contribute to developing a more globally usable knowledge for the field.

(e) ***Reflection from the researcher's role for the study***

Being involved in the study as the teacher-researcher was a revelation. It allowed the researcher to absorb and observe multiple types of displayed emotions and physical and verbal feedback from the students. All of them were first-hand information. There were

no filters. Subsequently, it became overwhelming. Despite that, these waves of uncensored data were informative as it made the researcher realise there were unannounced, unseen and unpredictable factors which would affect the design and development of feedback process. For example, students' assignment load of other courses would affect the feedback environment in the current course. This was perhaps something which one may overlooked. By getting first hand data, the researcher was able to make some immediate changes to the design of the feedback process.

4.4 Sampling

The aim of this study was to design, develop and identify instructions in sustaining feedback within TILE. Hence, the students of the course were the samples for this study. The number of students used as sampling were seventy-five (75). At the later stage, only a selected number of students were involved. At the later stage, these students would be interviewed. The number of students were ten (10). The choice of these purposive sampling would be able to provide information-rich cases for the intended study (Patton, 1990). The students were end-users for the applied instructions. They were loosely chosen based on the following criteria: (1) Actively involved in the feedback process (2) Average involvement in the feedback process. The word "loosely" was used because there was no fix rubric in selecting the participants for the two items. The activeness included were participation in giving feedback, the speed of attempting the given activities such as submitting the blog-post, and frequent physical participation during face-to-face class session. The first-hand experience would provide significant data in identifying the instructions for sustaining the feedback process. Therefore, this sampling strategy would permit the selection of a target group which was satisfactory for the specific aim of the research questions (Cohen & Manion, 1994).

4.5 Data Planning Matrix

Data planning matrix is a practical tool in designing research (LeCompte & Preissle, 1993). The matrix (refer to Table 4.1) planned in designing and developing the current research is provided below as a summary of the correlation between the research questions and parts of the research.

Table 4.1

Data Planning Matrix Adapted from LeCompte and Preissle (1993)

Research Question	Rationale	Data Required	Source of Data
What instructional strategies will sustain feedback in a technology integrated learning environment (TILE)?	To identify instructional strategies which can engage and maintain feedback within TILE	Observation on students using the ICT tools: LMS, eportfolio, email, chat tools	Normal class
		Questionnaire	Students from the course
		Interview	Students selected from the course
What are the challenges which occurred during the feedback implementation in a technology integrated learning environment (TILE)?	To identify the challenges which occurred during the feedback implementation in TILE	Observation on students using the ICT tools: LMS, eportfolio, email, chat tools	Normal class
		Questionnaire	Students from the course
		Interview	Students selected from the course

4.5.1 Questionnaire

The students were issued with the questionnaire during class time and asked to complete them within a week. The questionnaires were handed in three parts: at the beginning of the course (week 1), the middle of the course (week 5), and at the end of the course (week 15). These questionnaires were designed to capture students' idea and experience on the feedback process. The questionnaires allowed the researcher to generate quantifiable data (Bryman, 1992) and to identify general trends in light of the themes emerging from the observation.

(a) ***Week 1 questionnaire:***

The given questionnaire was posted in the LMS-Moodle. In the questionnaire, students were asked to indicate their gender whether they were male or female. This was followed by two questions. The questions were as followed:-

1. Do you comment (give feedback) on your friends' activity in these Web 2.0 tools?

   -The mentioned Web 2.0 tools were Youtube, Blog, Facebook, and Myspace.

2. What is your opinion in giving and receiving feedback via Web 2.0 tools for your learning (e.g. Facebook, Youtube, Blog)?

The first question was a 3-point itemised rating scale; 'regularly', 'seldom', 'do not believe in giving comments (feedback) online'. The second question was open-ended. The purpose of the questionnaire was to determine students' prior experience on (giving and receiving) feedback in an ICT environment. The questionnaire also intended to seek the students' point of view in the feedback process using Web 2.0 tools.

(b) ***Week 5 questionnaire:***

The week 5 questionnaire was posted in the LMS forum. There were four questions. The questions were as followed.

1. How effective are you as a feedback giver?
2. What have you learnt from giving feedback?
3. What else could you do to be a more effective feedback giver?
4. Describe your experience as the receiver of feedback.

The goal of these questions was to gauge students' experience towards the feedback culture. Next would be to extract possible issues from the applied instructional strategies in the feedback process on the TILE platform which could have occurred during the seven weeks. The possible issues would be the frequency of giving feedback from the lecturer and tutors, and peer feedback. The researcher would be able to adjust the flawed instructional strategies for the following weeks.

(c) ***Week 14 questionnaire:***

The final questionnaire (refer to Appendix E) had 12 statements/questions. In the first section (refer to Table 4.2), there were four questions on the frequency of received and given feedback. The section was a 5-point itemised rating scale; '1-Never', '2-Rarely', '3-Sometimes', '4-Often', '5-Always'.

The first question looked into the frequency of the students receiving feedback via the four main methods; (1) face-to-face (2) written email (3) chat tools and (4) podcast. The purpose of the question served as a form of triangulation on how much feedback was required to sustain the feedback process. The following questions as seen in Table 4.2 were of similar purpose.

Table 4.2.

Questions for the First Part of Week 14 Questionnaire

Please circle the most appropriate answer using the scale:

1-Never 2-Rarely 3-Sometimes 4-Often 5-Always

1. How frequent did you receive feedback from the lecturer/tutor's during the course?
   a. Face-to-face
   b. Written Email via gmail / facebook message
   c. *Chat via Yahoo messenger or MSN or Facebook chat*
   d. Podcast
2. How frequent did you receive feedback from your peers during the assignments (group or individual)?
3. How frequent did you receive feedback from your peers for each of your entry in GOOGLESites?
4. How frequent did you give feedback to your peers during the assignments (group or individual)?

The following section of the questionnaire (refer to Table 4.3) comprised of three categories consisting with different conditions: (1) Quantity and timing of feedback, (2) Quality of feedback (3) What the student do with the received feedback. Students were asked to indicate their agreement or disagreement with the statements along a five-point scale; '1-strongly disagree', '2-disagree', '3-neutral', '4-agree', '5-strongly agree'.

The categories and the conditions were adapted from the Assessment Experience Questionnaire (AEQ). The 'Assessment Experience Questionnaire' (refer to Appendix F) was initially developed by Gibbs and Simpson (2003) to provide quick and easy evidence from students about the extent to which students experience the 'eleven conditions' to be met with (Brown, Gibbs and Glover, 2003). The eleven conditions which were grouped under five headings are shown in Table 4.4. For this research, the intention of the questionnaire shown in Table 4.4 was to provide a form of measurement on the strategies in being able to sustain feedback in TILE.

Table 4.3

Second Section of Week 14 Questionnaire

A. Quantity and timing of feedback		
a.	I was given feedback at the start of the course.	1 2 3 4 5
b.	On this course I get plenty of feedback on how I am doing.	1 2 3 4 5
c.	The feedback comes back very quickly.	1 2 3 4 5
d.	There is hardly any feedback on my assignments when I get them back.	1 2 3 4 5
e.	When I get things wrong or misunderstood them I don't receive much guidance on what to do about it.	1 2 3 4 5
f.	I would learn more if I received more feedback.	1 2 3 4 5
g.	Whatever feedback I get comes too late to be useful.	1 2 3 4 5
B. Quality of feedback		
a.	The feedback mainly tells me how well I am doing in relation to others.	1 2 3 4 5
b.	I was given detailed feedback that helped me improve my assignments	1 2 3 4 5
c.	I was given feedback on my learning progress throughout the course.	1 2 3 4 5
d.	The feedback helps me to develop my intellectual skills.	1 2 3 4 5
e.	The feedback helps me to understand specific course content.	1 2 3 4 5
f.	The feedback shows me how to do better next time.	1 2 3 4 5
g.	Once I have read the feedback I understand why I have to redo the assignment.	1 2 3 4 5
h.	I don't understand some of the feedback.	1 2 3 4 5
i.	I can seldom see from the feedback what I need to do to improve.	1 2 3 4 5
C. What you do with the feedback		
a.	I read the feedback carefully and try to understand what the feedback is saying.	1 2 3 4 5
b.	I use the feedback to go back over what I have done in the assignment.	1 2 3 4 5
c.	The feedback does not help me with any subsequent assignments in this course.	1 2 3 4 5
d.	The feedback does not help me with assignments from other courses.	1 2 3 4 5
e.	The feedback prompts me to go back over materials covered earlier in the course.	1 2 3 4 5
f.	I do not use the feedback for revising.	1 2 3 4 5

Table 4.4

Conditions under which Assessment Supports Student Learning by Brown, Gibbs and Glover (2003)

Quantity and distribution of student effort
Condition 1 Assessed tasks capture sufficient study time and effort
Condition 2 These tasks distribute student effort evenly across topics and weeks
Quality and level of student effort
Condition 3 These tasks engage students in productive learning activity
Condition 4 Assessment communicates clear and high expectations to students
Quantity and timing of feedback
Condition 5 Sufficient feedback is provided, both often enough and in enough detail
Condition 6 The feedback is provided quickly enough to be useful to students
Quality of feedback
Condition 7 Feedback focuses on learning rather than on marks or students themselves
Condition 8 Feedback is linked to the purpose of the assignment and to criteria
Condition 9 Feedback is understandable to students, given their sophistication
Student response to feedback
Condition 10 Feedback is received by students and attended to
Condition 11 Feedback is acted upon by students to improve their work or their learning

The final section of the questionnaire required the students to describe their learning experience after immersing in the feedback culture set in TILE. At the same time, the framed questions would also lead to insights derived from the instructional strategies on the feedback process. The questions were as followed:-

Comments you would like to make about the way these forms of feedback affected your learning throughout the course.

1. Feedback (e.g. written email, chat, podcast, face to face, comments on Googlesites) between you and the lecturer/tutor
2. a. How much have you learnt from the feedback given by your peers?

   b. From the start until the end of the course, how much have you learnt from being the feedback giver?

3. What are the problems / challenges which you have experienced during the feedback activities throughout the course?
4. What suggestions do you have for us to improve the feedback activities and experience in the course?

The data received from the final questionnaire helped in shaping the question used for the interview session. See Section 4.5.4

4.5.2 Observation

According to the definition provided by Creswell (2005), observation was "*the process of gathering open-ended, firsthand information by observing people and places at a research site"*. Observation could only be a research tool when it fulfills the following criteria: answers a specific research question, being systematic, and subject to the checks and balances in producing reliable results (Merriam, 2009). This method was crucial to this study because it allowed the researcher to notice things that may lead to

understanding of the context (Merriam, 2009). The following indicators adapted from Hatzipanagos and Warburton (2009); power (autonomy and ownership), timeliness, dialogue, visibility, appropriateness, action, community and reflection, were used during the observation process. At the same time, these set of questions were used as a guide to observe the indicators:

-How were the students managing the given instructions?

-What instructions did the students react positively to?

-What were the students' reaction and response towards the implemented instructions?

In this study, observation notes were made in every class lesson either during face-to-face session or online activity. The collected data were compared and contrasted across all data sources.

4.5.3 Document and Artefact

This method of information represents a valuable source for text (word) data for qualitative study. Creswell (2009) stated two advantages which were relevant to this research: *(1) They provided the leverage of being in the words of the participants, who have usually given thoughtful attention to them. (2) They were also ready for analysis without the transcription that was required with observational or interview data. In* this study, the course documents, comments extracted from the online forum, emails from the students and chat tools were categorized as documents. In addition, the students' assignment products were qualified as artefacts. In short, these mined items provided an in-depth understanding on the research questions.

4.5.4 Interview

DeMarrais (2004) wrote that an interview is a process in which a researcher and participant engage in a conversation focused on questions related to the research study.

Interviews provide useful information because they allow participants to describe detailed personal information. In other words, the researcher was able to enter the participant's mind (Patton, 1990). For this study, online interview via Instant Messaging (IM) tool was used to collect the students' feedback on the instructions applied during their class lessons. The IM tool used for the online interview was Facebook Chat. The reason for the interview conducted via online was the students were not available during the requested sessions.

Semi-structured guided interviews were conducted on the selected ten students using informal and open-ended type of questions to obtain more information about their experience using feedback in TILE. The objectives of the interviews were to unearth their viewpoints and insights from their experience, and to acquire their directions and prescriptions for future use. Therefore, the interview permits it to evolve as a natural discussion and conversation, even though navigated by a pre-determined framework. Marton (1994) mentioned that the development of ideas would be inhibited when introduced set questions, and short, unelaborated answers would be encouraged. Much fuller descriptions are provided when the interviewer put in effort to explore the student's interpretation of experiences. Of course, the interviewer has to play as a neutral foil to the developing explanations. The interviewer is not to present his / her ideas or opinions. The neutral foil which the interview takes is within that constraint a more interactive style that does seem to work well for the purposes of this particular type of interview.

The interviewees were chosen based on their performance in the course. Some interviewees had performed well during the course and excelled in the feedback process, while some were average performers with less interaction during the feedback

process. Based on the selection, it was hoped that an amount of data would reveal answers to the research questions.

4.6 Validity and Reliability

This research had adopted the validity and reliability guidelines developed by Merriam (2009) (refer to Table 4.5).

Table 4.5

Validity and Reliability Guidelines Developed by Merriam (2009)

Strategy	***Description***	***Application for the study***
Triangulation	Using multiple investigators, sources of data to confirm emerging findings.	Besides conducting observation, other methodology such as questionnaire, and interview were conducted to validate the data.
Member Checks	Taking data and tentative interpretations back to people from whom they were derived and asking if they are plausible	The researcher did regular communication (via email and face-to-face) with the course lecturer on the design research and data.
Peer review/examination	Discussions with colleagues regarding the process of study, the congruency of emerging findings with the raw data and tentative interpretations	

(table continues)

Strategy	*Description*	*Application for the study*
Rich, thick descriptions	Providing sufficient descriptions to contextualize the study such that readers will be able to determine the extent to which their situations match the research context, and hence, whether the findings can be transferred	Refer to Chapter 3 and Chapter 5 for the descriptions.

4.7 Data Analysis

Merriam (2009) equate data analysis as the process to answer the research question(s). Prior to that, she further explained that data analysis is the *meaning making out of the data* which consists of consolidating, interpreting and reducing what people had mentioned and what the researcher has read and observed.

Data from the following sources – the feedback from the questionnaire, the interview transcripts with the students, and other documentary evidence and notes were studied using the techniques of qualitative analysis suggested by Miles and Huberman (1994). The five stages analysis comprised the three steps process outlined by Miles and Huberman; (1) data reduction, (2) data display, and (3) conclusion drawing and verification. The coding of data process is summarized in Table 4.6, together with Miles and Huberman's three steps and computer software applied.

The first part, **transcribing** involved the process of transcribing the data from the questionnaire (Refer to Appendix G) and interview (Refer to Appendix H). Microsoft Excel was used to contain the transcribed data for questionnaire while Microsoft Word was the platform for the transcribed data from the interview.

Data analysis began at the first stage: Data Reduction. It comprised of two parts. The first part, **coding** consisted of giving a code for individual comments extracted from the questionnaire and interview. For the comments derived from the questionnaire, each were coded according to strategies identified from Dimensions of formative feedback and assessment (Hatzipanagos & Warburton, 2009) at Table 3.3, pp.77. (Refer to Appendix I for a sample). As for the data extracted from the interview transcript, it was also roughly coded against the same strategies. Next, a thorough analyst was carried out in the second part, **sub-coding (**Refer to Appendix J**)**.

At this section, each node dialogue, was thoroughly probed to unfold emerging themes and issues. Sub-categories were decided and suggested as new nodes.

The second stage, **Data Display,** looked into arrangement of data into suitable displays which allows **conclusion drawing and action**, the third stage.

Table 4.6

Three steps analysis of data according to Miles and Huberman (1994)

Description of process used to analyse data	**Three steps of analysis according to Miles and Huberman (1994)**	**Software used**
Transcribing: Interview and questionnaire data transcribed for analysis		Microsoft Word for Interview, Microsoft Excel for Questionnaire
Coding: Individual comments coded according to categories determined by the strategies guidelines which were divided into seven components adapted from the Dimensions of formative feedback and assessment (Hatzipanagos & Warburton, 2009) (Refer to Table 6). Each component comprises a node. **Sub-coding**: Each node, e.g. dialogue, was investigated in more detail to reveal the themes and issues which emerge. Sub-categories were determined and nominated as new nodes.	Data reduction: Selection, focusing, simplifying, abstracting and transforming the data	Microsoft Word for Interview, Microsoft Excel for Questionnaire

(table continues)

Description of process used to analyse data	Three stages of analysis according to Miles and Huberman (1994)	Software used
Ordering and displaying: Identified patterns and themes, and made generalisations. Data is arranged accordingly into appropriate displays	Data Display: Creation of organized, compressed assembly of information that permits conclusion drawing and action	Microsoft Excel
Conclusion drawing: Conclusions were made and written up for inclusion in the thesis	Conclusion drawing and verification: Decisions about the meaning of data and testing validity of findings.	Microsoft Word
Verifying: Conclusions were verified by reference back to original data and review		Microsoft Word

4.8 Ethics and bias

Data collection should not be biased. It should be ethical. It has to respect sites and individuals (Creswell, 2005). It was noted that in this research design, the researcher role may have produced a tier of biasness since the researcher was in a role of teaching authority and hence, was also teaching the students. However, the students were informed on the study which focused on feedback, the planned research and the purpose for the research in the aspect of improving the students' learning experience. All the students were informed on the following items; (1) confidentiality (2) anonymity (3) the opportunity to not participate in the research and (4) the opportunity to withdraw from the research at any point in time. The consent form (Refer to Appendix 101) was distributed to receive their permission before collecting data.

4.9 Summary

This chapter introduces the research methodology and the research design. The motives for the methodology and the research design have been debated and justified critically. The results from the research are examined in chapter 5.

CHAPTER 5: FINDINGS

5.1 Introduction

In this chapter, an analysis of quantitative and qualitative data collected from the study is presented. This chapter illustrates the analysis of data collected from observations, artifacts created by participants, questionnaires and interviews. The objective of the analysis was to resolve the answers to the following research questions:

1. What instructional strategies will sustain feedback in a technology integrated learning environment (TILE)?
2. What are the challenges which occurred during the feedback implementation in a technology integrated learning environment (TILE)?

5.2 Instructional strategies to sustain feedback in TILE

This section presents the strategies applied to sustain feedback within TILE. The overarching goal for this research question is to identify instructional strategies (refer to Table 3.3, pp.77) in sustaining formative feedback that are the most effective and efficient in promoting learning. The themes for the instructional strategies (Table 5.1) were extracted from the guidelines in sustaining feedback (refer to Table 3.3, pp.77). At the same time, the data analysed in this section also identified the conditions which sustained formative feedback. As Cohen (1985) mentioned feedback "was one of the more instructionally powerful and least understood features in instructional design". It is hoped that the analysed data illustrated for each instructional strategy will prove the power which feedback holds and clear the doubts on the features of feedback.

Table 5.1

List of strategies applied to sustain feedback In TILE With Coding for Questionnaire

Alignment of assignments with feedback	A01	Duration for feedforward
	A02	Feedback as an evaluated item in an assignment.
Use of technology tools	P01	Appropriate digital tools
Peer feedback	G01	Creating main groups and sub groups for iterative feedback
Delivery	D01	Prompt and constant flow feedback
Content	C01	Constructive, concise, focused and meaningful to feed-forward and feedback loop

5.2.1 Alignment of assignments with feedback

Feedback can be acknowledged as a force to reckon with if the students are given the opportunity to use the information to alter the gap (Ramaprasad, 1983). One of the issues which students faced was the inability to utilise the received feedback while the subject was being taught. Such occurrence was due to insufficient time to apply the feedback in the work. Accordingly, two strategies were put forward to minimize the occurrences.

(a) ***Duration for feedforward***

The flow of each assignment for the course was equipped with the strategy of providing duration for feedforward in order to overcome this issue. As explained in Chapter 3, the structure allowed the students to reflect and apply the feedback content to better their assignments' end product. According to Race and Brown (1998), one of the factors to successful learning was digestion; a level which involved

receiving feedback on the success or otherwise of the learning process, often from other people, and on the importance of reflecting on one's learning experience and developing a sense of 'ownership'. When a student reflects on their learning experience, it will lead to transformative learning. Mezirow (1991) described this process as resulting in new or changed directions. In other words, the reflection process allows the learners to change their habits of expectation and, correspondingly, develop more specifically correct directions, achieve greater flexibility and creativity and avert premature cognitive engagements (Mezirow, 1991). These outcomes prepares the learners to establish improved ‘ownership’ of the learning material, making it more personally meaningful to themselves while bettering their mastery of it (Rogers cited in Moon, 2001).

As a result, it was crucial to grant students the opportunities in a form of time to digest and apply feedback (refer to Figure 5.1 and Figure 5.2). As shown in Example A (refer to Figure 5.1), the students were given a duration of one week to *digest and apply* the received feedback. The one week period was due to the type of task. At the beginning of Assignment 3, the students were asked to provide the title of the product and learning objectives before developing the product. During the time frame, the students posted the items in the online forum of the LMS platform (Moodle). The students were informed that they were only allowed to proceed to the next phase of the assignment if the learning objectives received were appropriate. The lecturer and the tutors would acknowledge the appropriateness of the posted items. These were translated in a form of feedback.

Figure 5.1. Example A on time-opportunity to digest and apply feedback

With regards to Example B (refer to Figure 5.2), the time frame given for students to utilise the feedforward was three weeks. The reason for this stage was due to requirements that the students were designing supporting materials for the main product. During this time, the students in their own respective group would be given the opportunity to seek feedback on the supporting materials from the facilitators. As shown in Figure 5.2, the group emailed their supporting materials to the facilitator to “check”. Based on the date seen in Figure 28, a day later, the facilitator replied the email with feedback on the supporting materials.

The students acknowledged that the time arrangement given for the assignments was sufficient for them to understand, and incorporate the feedback.

*"The **duration** given for each assignment is **sufficient** for me to correct and **make necessary changes**."*

(Student Hui; online interview)


My Lesson Plan for Booklet, The edited version for ppt, and the edited version of instructions for 'Godzilla says' game

<gsking88@gmail.com> 10/22/10

Miss
I am sorry I sent you these a bit late. Actually I wanted to show you on wednesday but did not manage as we were having presentation that day.

Regarding the power point:
The animals in the wallpaper is different as the one in the slides.
This is because the animals in the slides are animated, and they cannot be converted into the format that can be fit into the wallpaper, so I am having problems there.
If i just leave it like this, is it ok? (with the animals in the slide different from the wallpaper) but they are the same animals shown in both wallpaper and in the slides.

'Godzilla says' game:
I have add in the points that you have mentioned.

Can Miss kindly check for me? Thank You. :)

Regards,

3 Attachments

W LP for booklet.docx P preposition_edit... W 'Godzilla says' ga...

richer@gmail.com> 10/23/10

to utayadevi88, siew, fioratanpy, hui_sun88, huichoat, uthorgkoai_88

Hello and g06,

For ppt slides, look at my feedback in the comments box (in ppt slide) You can use the feedback not in this class but later in other subjects too (or when you go to class to teach)

This is because the animals in the slides are animated, and they cannot be converted into the format that can be fit into the wallpaper, so I am having problems there. --- yes you can.
Instructions -
First on the slide, right-click the image - u will see SAVE as PICTURE, click that and your GIF image will be saved as picture...by the way when you save the picture, please save in PNG format because it is clearer than JPG.

Now for you LP-please aligned the instructions of both student and teacher.

If you notice (which I am doubting here, same goes with your other friends), for your other frens LP, i did some changes in their LP like moving certain instruction for the student to match the teacher instruction.

Ms

PS: the reason why I cc-ed because somehow every feedback given can be useful to each and everyone of you not now but later.

2 Attachments

P preposition_edit2... W LP for booklet_ed...

Figure 5.2. Example B on opportunity to digest and apply feedback

One particular student remarked that the time allocated (one week for beginning stage and three weeks at a later stage) for the response, digestion and application of the received feedback for Assignment 3 was ample.

*"The duration given is quite an **ample time.**"*

(Student Flor; online interview)

It was interesting to note that Student Flor also pointed out that she frequently checked for any received feedback. She would then take immediate action (Refer to Figure 5.3)

*"I will **always check** if any feedback is given so naturally I'd have ample time to respond to it."*

As shown in Figure 5.3, Student Flor replied and acted upon the given feedback on the same day. Based on the time stamp (Figure 5.3), the student acknowledged the feedback (sent at 6.01PM) at 6.25 PM. At 7.14 PM, which was less than an hour, the student informed the facilitator on the situation. The iterative feedback loop ended when the student was able to sort-out the issue. This could also be interpreted that the student's initiative was one of the significant factors to contain the feedback loop and ensured feedforward.

Student Flor mentioned that another factor which contributed to the "ample time" was also due to the clarity of the feedback message (Item 5.2.5).

"Yes, the duration given to respond to the feedback given was enough for me as it didn't take me long to figure out what the feedback meant."

The aspect of "clarity of the feedback message" will be discussed in the ***content*** section. On the other hand, Student Flor also stressed that she would seek the feedback giver for further elaboration if she could not comprehend the feedback message.

"If I'm in doubt or unclear about what it means, I'll ask the person to elaborate."

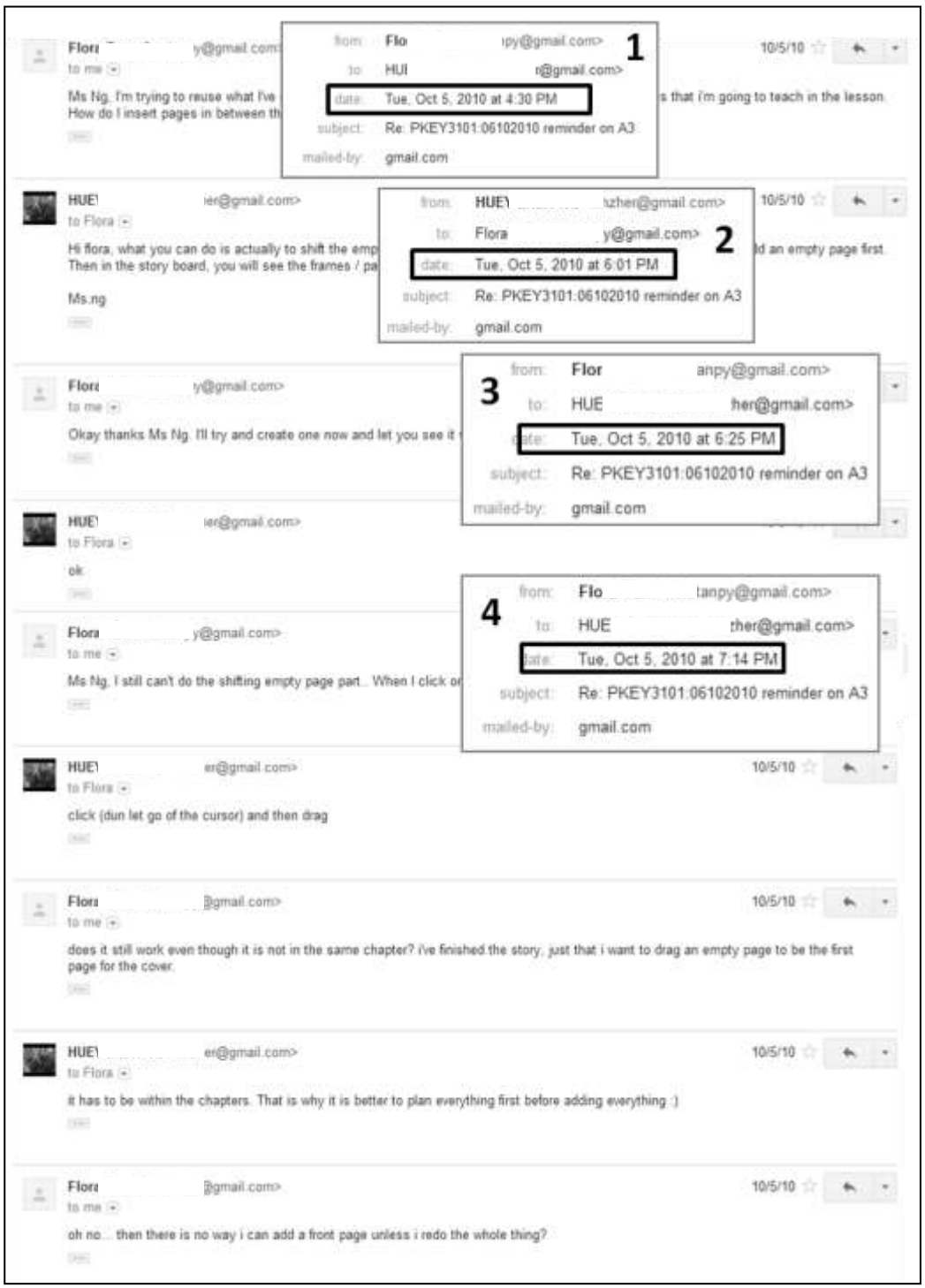


Figure 5.3 Immediate action taken by student

Similar sentiments were also seen in other students (Refer to Student Dom, Student Wong and Student Lingam). The similarities were very striking as both Student Dom and Student Wong attributed the sufficient time to the prompt feedback from the lecturer and tutor (Item 5.2.4).

> *"The duration given to correct and modify item is **enough**. This is because the **immediacy nature of the feedback**."*
>
> (Student Dom; online interview)

> *"**Enough time** were given for us to **receive the feedbacks and think through our work**, thus producing much better end results. This is because I always **get the feedback early** and the duration for me to edit the assignment was enough."*
>
> (Student Wong; online interview)

On the other hand, there was another discovery on the chances to carry out the feedback. Student Lingam voiced out that the opportunity to execute the feedback in their homes, gave them ample time to modify the items.

> *"The duration given is enough and we can **modify items in our home** itself by referring to our peers, lecturer and facilitators' feedback. Thus, there is no reason to say no time to modify items."*
>
> (Student Lingam; online interview)

After looking at the following students' responses, it was clear that this concept of providing a period of time which granted window of opportunities to correct the items based on the given feedback was well received by the students. Therefore, it can be

interpreted that the strategy of providing duration to feedforward cannot function alone. Other roles need to be present, such as clarity of the feedback message, prompt feedback from the lecturer and tutor, and the chances to carry out feedforward during non-class hours, which would ensure the success of this method and hence, should not be totally ignored.

(b) ***Feedback as an evaluated item in an assignment***

For feedback to be effectively used as a form of assessment *for* learning, it is imperative that the students are involved in the feedback culture. Research has shown that the impact of feedback on student learning will be limited unless students are engaged actively with the feedback (Mann, 2001; Rust, 2002). However, this particular strategy was only suitable to assignment of reflection type. This strategy of making feedback as an evaluated item in the assignment came as a surprise to many students. This concept was new to them.

> *"I was **surprised** because that was the **first time** my feedback would be evaluated."*
>
> (Student Flor; online interview)

> *"My initial reaction was **surprised** as I have **never come across** with feedback as the evaluated items in assignment."*
>
> (Student Ling; online interview)

At the end of the semester, this strategy received very positive comments from the students. A feedback which is evaluated will keep the students on their toes when it came to writing the feedback. The pressure will "push" them to give the feedback to their peers. An assessment rubric for the evaluated feedback was also developed. The

rubric helped the students to be more focused in providing constructive feedback to their peers. The rubric had helped the students to understand expectations and components of an assignment. In other words, Student Flor would say it made her think first which eventually made her learn the skill of wording feedback in an accurate manner.

> *"Overall, I'd see a graded feedback as something good because* ***it makes me think first*** *before simply writing something just for the sake of filling in the space. Also,* ***I learn to word what I want to say more concisely.****"*
>
> (Student Flor; online interview)

This strategy also served as a reminder. According to Student Ling, this factor made her consistent in following the progress of her assignments and feedback.

> *"…feedback as the evaluated items in assignment…it will make me to be more* ***consistent*** *in* ***following up the progress of my assignments*** *as well as my* ***feedback*** *more frequently.*
>
> (Student Ling; online interview)

Since feedback was being evaluated, the students would be pushed to think outside the box in constructing feedback. According to Student Afi, this reflected the learners' comprehension, proficiency, and maturity in their thoughts towards the course. This thought-provoking statement from Student Afi had shown that students would be able to achieve the higher order thinking level.

"I think feedback as one of the evaluated item in assignment is good because it ***shows the understanding, mastery and maturity of thoughts of the student about the subject learned****."*

(Student Afi; online interview)

Despite being compelled to give feedback, Student Wong saw the strategy as a *fair* evaluative item. Student Wong mentioned that many students have found the strategy troublesome in the initial stages. Later, they realised that this concept would one day bring benefits when they start working. This was because participating in the feedback activity trained the learner to think, analyse, judge, and reflect. These skills were necessary for university graduates who will be facing the working world. Students reflected on the utility of feedback and its relevance to their future. Their perceived relevance helped them to accept the strategies as an important tool to develop the necessary skills that they might need in the future. Student Wong ultimately insisted that including feedback as an evaluative item in an assignment was essential.

"I think it is a ***fair*** *evaluative item as feedback is actually very essential in the process of learning. Many might find it useless or something added to make learning more troublesome but one might find feedback very useful when he/she step into the working world. Feedback* ***trains d mind to think, analyse, judge, reflect*** *and these are thinking skills worth nurturing. Universities should prepare and equip students to face the working world and in my opinion,* ***putting feedback as*** *one of the* ***evaluation items*** *for assignment is a* ***must*** *to achieve that."*

(Student Wong; online interview)

Like the other students, Student Maha, too, mentioned that *"...feedback is a worthwhile evaluated item for the assignments*." His positive reaction was an exclamation of happiness in regard to the implemented strategy.

> "*Feedback, I love it! When it comes to feedback, that's where I will go wild.*"

Such compelling reaction was due to several reasons: (1) there was satisfaction in assisting other students (2) feedback mould the students to be a better student (3) feedback under the pretext of "criticism" was actually a "helping hand"

> *"...where it gives us self-satisfaction to help others and at the same time mould ourselves to be a better person. When we get a feedback in the disguise of criticism, we should perceive it as a 'helping hand'. From the feedback, we will know our strengths and weaknesses."*
>
> (Student Maha; online interview)

It can be summarised at this stage that the strategy of evaluative evaluating feedback can be applied for the purpose in sustaining feedback.

5.2.2 Use of technology tools

Elliot (2007) argued that ICT can be used as a tool to metamorphose feedback in a contemporary collaborative and personalised learning context. Technology played a crucial role in personalising feedback, and so contributed to strengthening teacher-student relationships (Yang & Carless, 2013). It was imperative to provide the appropriate conditions to sustain feedback. On that account, the following were the strategies to maximize the application of technology tools for the purpose of sustaining feedback.

(a) ***Use appropriate digital tools***

For this reason, it was important to select the appropriate technology tools to maximize the results. There were two parts to this strategy. First, the choice of technology tool to sustain the feedback process for the course assignments. Second, the technology tools selected to maintain the constant flow of the feedback process for the class.

i Selection of technology to sustain feedback for the assignments

In order to sustain the feedback for the assignments, namely ePortfolio and also reflection, it was vital to pick the right technology tool. For this course, Google Sites was the choice to upkeep the purpose.

> *"Googlesites is totally a new way of learning. It bring advantages … I* ***can easily get feedback*** *to improve on my entry anytime and anywhere as long as I am connected to the internet*."
>
> - Taken from questionnaire: P01

For instance, many students agreed that one of the features from Google Sites which was to allow the students to check on the received feedback at any time and place promoted convenient retrieval on the feedback message. On that account, students were granted the flexibility to improve their entries in both time and location. This aspect was essential. Without the opportunity to utilise feedback, the feedback process would be interrupted.

Another feature from Google Sites is notifying and informing the students that their entries were read with the given feedback. Hence, it prevented the feedback flow from being disrupted. When the students learnt that their items were "thoroughly" read from the received feedback, they felt the keen interest from both lecturer and peers. In other

words, this positive enthusiasm would give them the motivation to participate in the feedback process.

> "*For Googlesites, it is **great to know** that my writing is read and given feedback. It helps me to improve a lot."*
>
> - Taken from questionnaire:P01

A research conducted by Patrick et al. (2000) had shown that a student's intrinsic motivation to learn could be sustained with teacher's enthusiasm. The data from the studies also reported that excitement, curiosity and interest can too be triggered through this approach. Similarly, findings gathered from another study by Kim (2011) had illustrated that direct association with peers' influence such as feedback would result in the learners having an affective reaction and valuing of the course. In other words, the students would yearn for a piece of the action.

In that event, it was necessary to choose the appropriate platform with features which were able to create an environment for sustaining feedback.

ii Selection of technology to sustain feedback for the class environment

The increasing prevalence of ICT in teaching and learning presents new opportunities to feedback. The functions from the selected tools listed in Table 5.2, were capitalised to ensure a firm foundation in the feedback culture conducted during the course.

Table 5.2

Specific examples of the digital tools chosen to sustain feedback for the class environment

Type of digital tools	**Examples on the type of digital tools**	**Purpose**
Email	Gmail	Communication tool between (1) lecturer/tutors-students (2) student-student
Instant Messaging	Yahoo Chat, GoogleTalk, MSN Messenger Facebook messenger	'Instant' communication tool

The various selections of technology tools applied for this course to sustain feedback were welcomed by the students. These various forms of feedback such as written email, and messages via IM tools were items the students looked forward to. This was clearly reflected from their comments on the questionnaire.

"It is good and to get feedback from various forms."

- Taken from questionnaire P01

"The variety form of feedback definitely helps to ***improve our learning process.****"*

- Taken from questionnaire P01

To be able not to depend on just one form of feedback gave the students the convenience of receiving feedback according to their preference. These choices removed the road block which hindered the flow of feedback.

"We *do* ***not need*** *to* ***depend on one*** *particular* ***form of feedback****."*

Taken from questionnaire P01

Nevertheless, one must take into account that the technological tools could only prove their function if properly managed and utilised. One of the students remarked that these technological tools were helpful especially when they were presented promptly and frequently. This brought a clear message that technology tools could not work by themselves. It had to be guided by the how-to-use instructions.

"The feedback given through all these mediums was very ***helpful especially they were given very instantly and constantly****."*

- Taken from questionnaire P01

The following were reviews by the students on their take on the adopted technology tools used during the feedback process in the course.

Email

"*All the feedbacks given through email really help in for learning."*

- Taken from questionnaire P01

Feedback via email assists the students' learning. Email can be retrieved at any time according to the user's convenience. These characteristics were frequently mentioned by the students and also the prerequisite to sustaining feedback.

"*Sometimes, during class we* ***are not able to catch up*** *what have been taught so by reading the email, it does helps.*"

- Taken from questionnaire P01

"...we can depend on written email when we are ***unable to have face to face****."*

- Taken from questionnaire P01

A student claimed that giving feedback via email can be interpreted as a "personalised" approach. The fact that the messages received via email remained in the inbox forever gave the students the advantage to frequently check and refer again to the email messages.

"*It more* ***personalised*** *and one would receive one mail and it* ***remains in their inbox****. Thus, we can* ***just check the delivered mail to reconfirm about anything****."*

- Taken from questionnaire P01

In addition, it was also mentioned that frequent reference to the email messages would prove to be beneficial if the feedback content was clear and easy to comprehend.

"In written email, the items mentioned can be ***read again and again*** *if I do not understand. It also depends on how the lecturer is giving the feedback. Most of the time, the lecturer/tutor went* ***straight to the point*** *which makes it* ***easier*** *to* ***understand*** *the point and* ***make the necessary amendments*****."**

- Taken from questionnaire P01

Besides that, some students were visual learners. For these visual learners, reading the feedback via email would help them to remember better.

"I really appreciate feedback in written emails the most because I normally use it as ***my reference point*** *in case* ***I forget*** *which part I need to improve on. Also, since I am a very* ***visual learner****, reading something visually will stick better and longer in my mind."*

- Taken from questionnaire P01

Another feature which sustained feedback was the ability to attach multiple files to the email message (refer to Figure 30). This feature was used to attach the students' product accompanied with written feedback.

Figure 5.4. Email feature-Ability to attach files

Accordingly, the students found this feature to be helpful.

> *"I prefer to read so I'll choose written emails as the tutors or the lecturer can* ***attach the corrected files****."*
>
> - Taken from questionnaire P01

> *"…this is the* ***most important*** *and* ***effective way*** *of giving feedback throughout the course."*
>
> - Taken from questionnaire P01

These findings coincide with Smith et al. (1999) study which demonstrated that email can be used successfully to deliver feedback. In other words, feedback via email could be acknowledged as one of the methods towards sustaining feedback in TILE.

Instant Messaging (IM)

Similar to email, the use of IM as a feedback vehicle was also brought gain in terms of receiving at anytime according to students' convenience.

> *"I could still receive feedback from my tutors anytime."*
>
> - Taken from questionnaire P01

The students who preferred the chat tool cited "fast feedback" from the lecturer and tutors when they (the lecturer and tutors) instantly received the messages from the students. With that speed, the students were able to correct their work at a quicker pace.

> *"Through Facebook and Instant messenger chatting allow us to receive fast feedback from the lecturer and tutors as they can respond to us once they receive our messages. With this, we can* ***proceed to our work quicker****."*
>
> - Taken from questionnaire P01

The speedy and instant replies via IM also meant that the students did not have to wait for the next class to consult with the lecturer and the tutors. Moreover, the students felt communication using chat tools was personal. They saw chat tool as the virtual person.

> *"Using chat or instant messenger is great because it is like* ***face to face; only the face is not there.*** *That's mean, any enquiries regarding the feedback given by the lecturer/tutor can be asked right away. They can also answer instantly and do not have to wait for the next class to consult them again for the feedback."*
>
> - Taken from questionnaire P01

Based on the students' reviews, it could be interpreted that chat tool was a suitable vehicle in sustaining the feedback process. All these criteria should be capitalized on

during the implementation of strategies in the aspect of application of technology for the objective of sustaining feedback in TILE.

5.2.3 Capitalising on peer feedback

For this element to work with the flow of sustaining feedback, the following strategy of breaking the large class into main groups and sub groups was necessary.

(a) Creating main groups and sub groups for iterative feedback

It was explained in Chapter 3 that the class of seventy-five students was divided into three main bundles. These bundles were further broken to smaller groups of five students each. This measure was to foster peer feedback-learning. Formalised peer learning helped students learn effectively (Boud, 2001). Askew and Lodge (2000) also argued that one of the characteristics of sustaining feedback was to involve students in dialogues about learning which raise their awareness of quality performance.

In other words, the peer dialogue which occurred among the set groups would in-turn promote the feedback process. The overall response to this strategy was very positive.

When the subjects were asked about peer feedback supported via groups, the majority commented that peer feedback provided tremendous assistance in improving their work such as easier comprehension of the issue at hand, the ability to reflect on their learning, and being able to identify their weaknesses. This was because peer learning allows the students to learn by constructing knowledge as they talked together and reached consensus or disagreement (Brufee, 1999). The comments extracted from the questionnaire clearly reflected peer feedback elevates learning amongst students (Falchikov, 2001) as they were actively engrossed in discussing evolving comprehension in the subject matter (Liu & Carless, 2006). Key phrases extracted from

the students' written statements such as "*noticed my weaknesses*", "*understand easily*", "*reflect on my learning*" depicted a feedback process which was functioning.

> *Through the feedback from my peers, I have **noticed my weaknesses** in entry.*
>
> - Taken from questionnaire G01
>
> *I learnt much by peers because through peers, I can **understand easily.***
>
> - Taken from questionnaire G01
>
> *My peers help me to **reflect on my learning** by giving their feedbacks I learn to **accept others' point of view***
>
> - Taken from questionnaire G01
>
> *As for me, feedback from peers … may improve my learning process well. Peers also are able to **detect my weaknesses**, thus, will give appropriate advice or feedback so that I may work toward it.*
>
> - Taken from questionnaire G01

Hartup (1992) interpreted friends as:

- emotional resources, both for having fun and adapting to stress;
- cognitive resources for knowledge acquisition and knowledge acquisition

This led to another response to this method: students turned to one another for support and advice on understanding task requirements (Poverjuc et. al., 2012). The students saw their peers as friends. In other words, the term "friend" would simply be illustrated as a person who is honest, and works together through thick and thin for the purpose of achieving success together. With just that concept running through the groups, feedback would not fall midway. The feedback transaction would continue to flow within the groups without losing its significance.

My friends help me a lot. This is because ***we are never competitive*** *but always* ***always cooperative****. They give me* ***honest views****, not telling me things I want to hear only.* ***I improved a lot****, thanks to their honesty.*

- Taken from questionnaire G01

Well, it was encouraging to receive feedback from peers. Through this, ***we learnt to build each other up*** *in … giving and exchanging opinions and experiences. It was good that peers did actually read our works and commented on it so that I could improve better.*

- Taken from questionnaire G01

Comments given were ***pure support****. Whenever I have made a mistake in my post they tell me about something wrong"*

- Taken from questionnaire G01

"…feedback that my ***friends*** *have given* ***helped to build the self-confidence in myself.*** *The feedback helps to produce a better work and writing. The feedback also helps me to realize my mistakes and it helped me to improve my work in order to produce a qualified work."*

- Taken from questionnaire G01

It was also pertinent to include that if the student viewed and worked with peers who acknowledge learning by immersing in learning activities, then the student too might be consumed in learning and would work harder at learning (Burross & Mccaslin, n.d.). Consequently, peers with positive mind-sets towards learning allowed and subsequently, would coach each other to fix goals such as chances to learn and achieve.

This peer support mechanism occurred also because they were the closest people they have of each other. In Maslow's hierarchy of motivation model, which Maslow described in 1954, he viewed the need for belongingness and love as a step toward achievement. In his argument, the item which hindered progress along the path to

achievement was the deprivation of more basic needs. In Maslow's hierarchy of motivation model, in order to address the needs of achievement, people must have belongingness and love issues satisfied. For example, if a student is deprived of relationship concerns, he or she would be less able to involve in classroom learning chances. The learning capacity was built on a foundation of comfortable relationships with teachers, peers and family. Classroom learning is about learning with or and in the presence of others.

> ***"Peers are the closest people*** *that I have around me here through their advises and feedback and I am able to* ***understand more*** *on the course much clearly."*
>
> - Taken from questionnaire G01

> *"Peers feedback is very important for me because* ***they are whom are closed to me****. So, they can help me if I request any opinion from them."*
>
> - Taken from questionnaire G01

These findings further supported the necessity to create groups for the purpose of peer feedback in order to sustain feedback. As mentioned by Boud (2001) peer learning settings provided a favourable platform for giving and receiving feedback on the learner's work and a context for comparing oneself to others.

5.2.4 Delivery

This element cannot be ignored from the feedback process in TILE. The following strategy was activated prior to this element: Prompt and constant flow of feedback. Both of the conditions of being prompt and constant went hand-in-hand during the feedback process. The conditions should not be looked at as two separate entities.

Table 5.3

Quantitative Data on the Timing of the Feedback Given by the Lecturer and Tutors

TIMING OF FEEDBACK	Strongly Disagree	Disagree	Agree	Strongly Agree
a. I was given feedback from the start of the course	0	0	31	30
b. The feedback comes back very quickly	0	0	34	23
c. There is hardly any feedback on my assignments when I get them back	32	31	0	0
d. Whatever feedback I get comes too late to be useful	21	36	0	0

(a) ***Prompt and constant flow of feedback***

In response to this strategy, the students found it favourable during the feedback process. It was strongly reflected in the quantitative data (refer to Table 5.3). In fact, more data was unearth in the qualitative category which supports the strong numbers as shown in Table 5.3.

"*The feedback ...was given very* ***instantly*** *and* ***constantly.***"

- Taken from questionnaire D01

Interestingly, one of the responses from the questionnaire indicated that this was the first time feedback was given at a constant flow. With the continuous feedback, the students were able to discern if they were on the right track.

"I would say this is the first course that I have encounters where the lecturer and the team of tutors would give us ***feedback from time to time****. With this then only we can know whether we are in the right track or not."*

- Taken from questionnaire D01

The constant flow of feedback also compensated for the weekly three-hour class. According to the students, a three-hour class was not sufficient to include the discussion between the lecturer and tutors with the groups. The "active emailing" from the lecturer and tutors was able to create another opportunity of discussion in a virtual environment.

> *"…have been **active in emailing us** the latest information, which we found it easier as we merely have 3 hours face to face session per week"*
>
> - Taken from questionnaire D01

The prompt feedback allowed the students to keep track of their work while helping them to correct the mistakes. This element coincided with Bruner's (1970) view that learning depended on 'knowledge of results, at a time when, and at a place where, the knowledge can be used for correction'

> *"…feedback was most **given quickly**, it helped me to keep in track with my work and help me to correct my mistakes*."
>
> - Taken from questionnaire D01
>
> "*Through these feedbacks, I am able to **improve myself and my learning in a nick of time**"*
>
> - Taken from questionnaire D01

Moreover, this strategy made the students felt that the lecturer and the tutors were concerned about their progress. This emotional reaction garnered from the students would be one of the reasons that feedback becomes valuable and significant for the students' learning. Prior to that, the students would look forward to receiving and exchanging feedback with the course instructors.

> *"The comments that I received through **email is replied after 2 days or less**, meaning that the **facilitators really concern about us and wanted to help us sincerely*****"***

- Taken from questionnaire D01

"*I am glad most of the time; feedbacks are replied within a short time. This* ***reflects lecturers and tutors****…****dedicated and concern about the progress of learning***."

- Taken from questionnaire D01

These findings further supported previous research (Wosley, 2008) on having constant and prompt feedback was vital towards sustaining feedback.

5.2.5 Content

Howley and Martindale (2004) argued that the tone of the feedback (e.g., positive, negative, neutral) should not be too evaluative, nor judgmental. Brookhart (2008) believed that good feedback consisted of the following characteristics; clarity, and specificity. Shute as cited in Burke and Pieterick (2010) suggested these guidelines for sustaining feedback:

- Focus feedback on task
- Provide elaborated feedback
- Present elaborated feedback in manageable units
- Be specific and clear with feedback message
- Keep feedback simple

It was without a doubt that the quality of the given feedback played a significant role in sustaining feedback within TILE. Consequently, during the course, the following strategy was mobilized.

(a) ***Constructive, concise, focused and meaningful to feed-forward and feedback loop***

As can be seen from Table 5.4, the high number of students whom strongly agree and agree on the following quality of feedback had proven that the lecturer and the tutors managed to embed the suggested characteristics in the feedback content.

Table 5.4

Quantitative Data on the Quality of the Feedback Given by the Lecturer and Tutor

	Strongly Agree	Agree
I was given detailed feedback that helped me improve my assignments	34	34
I was given feedback on my learning progress throughout the course	27	35
The feedback helps me to develop my intellectual skills.	31	35
The feedback helps me to understand specific course content.	27	34
The feedback shows me how to do better next time.	36	25
Once I have read the feedback I understand why I have to redo the assignment	31	33

As mentioned by a student, "*there are a variety of feedbacks above par*."

These *above-the-par* feedback given during the feedback process made the students felt that both the lecturer and tutors were putting much effort in helping them.

> "*…the feedbacks were packed and informational that showed the tutors and lecturer really* ***concentrated on my works or assignments***."
>
> - Taken from questionnaire C01

Prior to that, the students perceived this as a form of being appreciated. On that account, it gave them the motivation to improve on their weaknesses.

"*It really made me felt **appreciated**. Hence, this **motivated** me to improve more on my minus points*."

- Taken from questionnaire C01

At the same time, it also boosted their self-confidence in producing better work quality.

"*…through feedback, I gain **confidence in myself**. In other words, it is like an **extrinsic motivation** which guides me to **produce a better writing or work***."

- Taken from questionnaire C01

Due to these circumstances, the students acknowledged the significance of feedback in their learning. When asked during the interview on the effect of this event, the students replied they looked forward to more feedback. In short, the evidence reflects the flow of feedback was being maintained.

5.3 Research question 2:

What are the challenges which occurred during the feedback implementation in a technology integrated learning environment (TILE)?

There were challenges which occurred during the implementation of the strategies as discussed in Research Question 1. The challenges were as followed:-

5.3.1 To provide quality feedback

Writing feedback had proven to be challenging for the students. There were times when the students were "*lost for words"*. This was because they *"...sometimes do not know how to give feedbacks."* There were a handful of students who tried to solve the

issue at hand. One student mentioned, "*Nevertheless, I tried my best to give positive feedback as best as I could."*

There were also times when the students *"…just don't know what to write and what should be written…"* This anxiety was caused by their concern towards their peers' feelings upon receiving feedback. According to the students, feedback needs to be worded carefully "*so that friends will not be offended."* Another cause to problem was also due to the new learning culture and experience: giving feedback. One of the students mentioned "*giving feedback to each other weekly is still new for us therefore I did face this type of problem*".

Hence, the students could have faced somewhat a culture-shock. Writing feedback which assists in learning required a high level of cognitive skill. In other words, these students were thrown in a new culture which needed them to constantly create feedback for learning. Consequently, issues pertaining to the quality of feedback occurred during the course.

At the same time, there was also misunderstanding among peers due to unclear feedback. Student A confessed that some feedback statements from the peers were misunderstood because the way it was being written.

> *"Some of my friends have* ***difficulty to express*** *what they want to say/convey a* ***meaning****. So I ended up* ***misunderstood*** *about some fact."*
>
> -Taken from Questionnaire, Student A

Unfortunately, these misunderstandings also lead to arguments among the peers as highlighted by Student A.

"Communications through written language can sometime be very ambiguous. Your friend might not understand you, and therefore ***heated up the discussion****."*

Moreover, conflict also happened because the students could not accept the feedback as pointed by one of the replies. Student B described the peers as not being able to accept the feedback rationally pushed them to an argument on the online platform, Google Sites. The situation also to an extent caused the relationship among peers to be severed.

"Sometimes comments are not accepted rationally by other peers and they tend to have an argument on the googlesites. This eventually ***ruins the relationship among peers****."*

-Taken from Questionnaire, Student B

Such strife did cause some unhappy students to delete the received feedback. It was intriguing to note that some of these students used technology to their own convenience. Regrettably, the lecturer and the tutors were unaware of this situation. It was made known when one of the students-the feedback giver informed the lecturer at the end of the course and via the questionnaire.

"This makes me wise while commenting especially when I am raising the weakness of a person's blog. Thus ***my comments will not be deleted from the entry****."*

-Taken from Questionnaire, Student C

Not every student succumbed to anger and took such action. There were other students who took the high road.

> "*There was one time when I put up a draft of the e-toys project and there were **repeating comments** of the same thing given by different people. That **kind of irked me** because I thought I'd read something different from the next person who commented. In the end, I kind of **replied in an unfriendly manner** and that nearly resulted in an argument. Of course **it was resolved after that***".
>
> -Taken from online interview, Student Flo

Student Flo explained a situation which made her annoyed. Her annoyance got the better of her which made her replied in an *unfriendly* manner to her peers' feedback comments. The immediate effect was an argument amongst them. The long term effect was the student concluded that the incident made her realise that she needed to be open-minded in order to receive any form of feedback.

> "*In terms of receiving feedback, sometimes my friends' feedback is too **tricky** to be answered. It may be **good in terms** of it really **triggers my thinking**, however, **sometimes** the question might just too **out of context** of my own reflection. I **still answered them** though.*"
>
> -Taken from Questionnaire, Student D

Another student recognized this issue which was labelled as "tricky" as an opportunity to stimulate his thinking. For question-type feedback which was not related to his entry, he would still reply in good nature.

"If the person ***cannot accept the feedback*** *that he or she has received, it will be* ***difficult.*** *They must* ***not take it personally*** *because it is for their* ***own good****."*

-Taken from Questionnaire, Student E

At the same time, there were students such as Student E, who was able to distinguish the purpose of the feedback activity and the need to conform to the feedback culture in order for them to reap the benefit.

During the course, it was observed that there were some students whom grasped the challenge by its horn and in turn changed the difficulty to their advantage. From the feedback activity and observing feedback given by both their peers and tutors/lecturers, they were able to reflect and came to a conclusion to what ingredients needed to churn a "good" feedback recipe. This was extracted from the following written replies.

"*Sometimes we just do not know how to give feedbacks. Nevertheless, I tried my best to give positive feedback as best as I could. This is because that is better to praise and then give suggestions rather than just critizing straight away."*

-Taken from Questionnaire, Student F

5.3.2 Too many feedback needed to be given

As described earlier in Chapter 3 on the design of the course and feedback implementation, students had to provide ten feedback (one feedback for one student) for their Assignment Two. Moreover, the students had to complete the task within the given week as they would risk having more feedback to give if the task was procrastinated. To most students, it became a challenge.

> *"**Too many feedback** needs to be given at one time. It might be **difficult** because sometime we **cannot think critically** and give proper feedback, so it might **end up giving repeated feedback** like others."*
>
> -Taken from Questionnaire, Student A

The students felt the number of feedback, ten, was too many. This caused the students to replicate the feedback to most entries in order to fulfill the requirements for Assignment Two.

> *"**Redundant feedback**. Most of the times we (peers) shared the same thoughts. When we give feedback, usually the areas we want the person to improve are always the same. There is **lack of varieties in the feedback**."*
>
> -Taken from Questionnaire, Student B

At the end of the course, it was noted that the undifferentiated feedback could have hindered the students' learning.

> *"The number of feedback given should not be limited. It depends on feedback giver on how much feedback that they want to give."*
>
> -Taken from Questionnaire, Student C

A student suggested that there should not be a number requirement in giving feedback. The learners should be given the choice on the amount of feedback. The idea was not feasible for the current classroom setting because there was a possibility that the students might just provide one feedback, and the possibility of not all the students

would receive feedback. Therefore, the recommendation would be to lessen the number of feedback for the assignment.

5.3.3 Insufficient time

This challenge was cited numerous times in the questionnaire. There were other subjects which the students were taking during the semester.

> *"**Limited time**; I have many other works to be settle. I can't focus only to this course."*
>
> -Taken from Questionnaire, Student D

The other subjects, according to the students, were also filled with assignments and mid-term tests. These lists of tasks demand similar time commitment. On that account, the students felt that there was not enough time to complete all the tasks. Since then, the students argued that it made them to merely skim through the entry and present a hollow feedback in comparison to a constructive feedback. Thus, the quality of the received feedback was compromised.

> *"Well, one of the challenges would be **time constraint**. As we were **packed with assignments, tests and task**s, I found that the one thing that prevented me from giving a good reflective feedback would be time limitation. There was always not enough time to do this and that. Hence, sometimes, it would just **force us to give merely read through feedback rather than a constructive one**".*
>
> -Taken from Questionnaire, Student E

"Time consuming in giving feedback. Thus, the ***quality of feedback is lower*** *than expected."*

-Taken from Questionnaire, Student F

The students revealed that time was vital during the feedback process. Firstly, it was necessary to thoroughly understand the content in which the feedback was supposed to be given to. It was also believed that the content cannot be simply taken for granted.

"*To read and understand their writing. I have to fully understand the ideas in their writing so that I can give relevant feedback to them. ... I have to read through their writing thoroughly to give effective feedback. All the topics and issues in their writing are not something we can for granted in giving the feedback."*

-Taken from Questionnaire, Student G

Secondly, they explained the length of time used include reading the feedback, and thinking how to reply to the given feedback. Hence, the time which they had was not sufficient to cover all the steps; reading the feedback, digesting the feedback, and thinking what feedback to reply.

"Time limit. In order to give feedback, we need to read theirs, then think what we need to comment; it does take time."

-Taken from Questionnaire, Student H

5.4 Summary

This chapter has investigated to answer the study's two research questions, leading to findings that illustrates the proposed strategies which were applied to sustain feedback within TILE (RQ1), and the challenges occurred during the implementation of the proposed strategies in TILE (RQ2). Further analysis and discussion on the findings are presented in the subsequent concluding chapter.

CHAPTER 6: CONCLUSION

The chapter starts with a brief of the research followed with conclusion and discussion on the findings. The chapter concludes with recommendations for further research.

6.1 Summary of the study

The study identified issues which handicapped the process of sustaining feedback within TILE. The research questions guiding this research were the following:-

1. What instructional strategies will sustain feedback in a technology integrated learning environment (TILE)?

2. What are the challenges which occur during feedback implementation in a technology integrated learning environment (TILE)?

Prior to research question no.1, five elements with each element consists of guideline(s) were listed. This was based on the literature on sustaining feedback. An environment for sustaining feedback in TILE was designed and developed. The environment was infused with the five elements and its guidelines. Research question no. 2 identified the challenges which occurred the feedback implementation in TILE. Question no. 2 was crucial to hear from students on the flaws which might be overlooked or misinterpreted during the feedback process in TILE.

Data was collected based on observations during the 15-week course. This was to determine the strategies on sustaining feedback. At the end of the study, questionnaires were given to the students to be filled and a sample of students was selected to be interviewed. This was to triangulate the data received during the observation period. At the same time, it was also to investigate the challenges from the students' perspective

which occurred during the feedback implementation in TILE. Findings from the data analysis reflected positive inclination of the performed strategies in the feedback process. On the other hand, it also revealed other items such as students had other subjects with assignments, and too many feedback to give, which caused issues during the feedback process.

An overview of the conduct of the research and presentation of the thesis is presented in Figure 6.1.

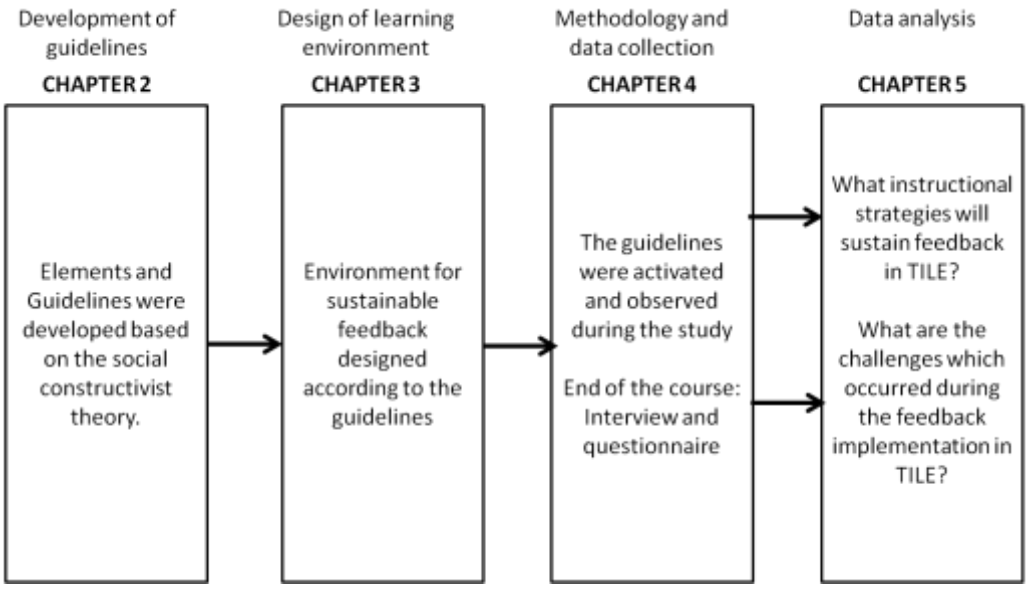


Figure 6.1 Overview of the research

6.2 Conclusion and Discussion

In conclusion, these findings suggest that a two-stages planned steps infused with the strategies are needed to ensure the feedback process is sustained. The two-stages planed steps (Refer to Figure 6.2) can be interpreted as a checklist.

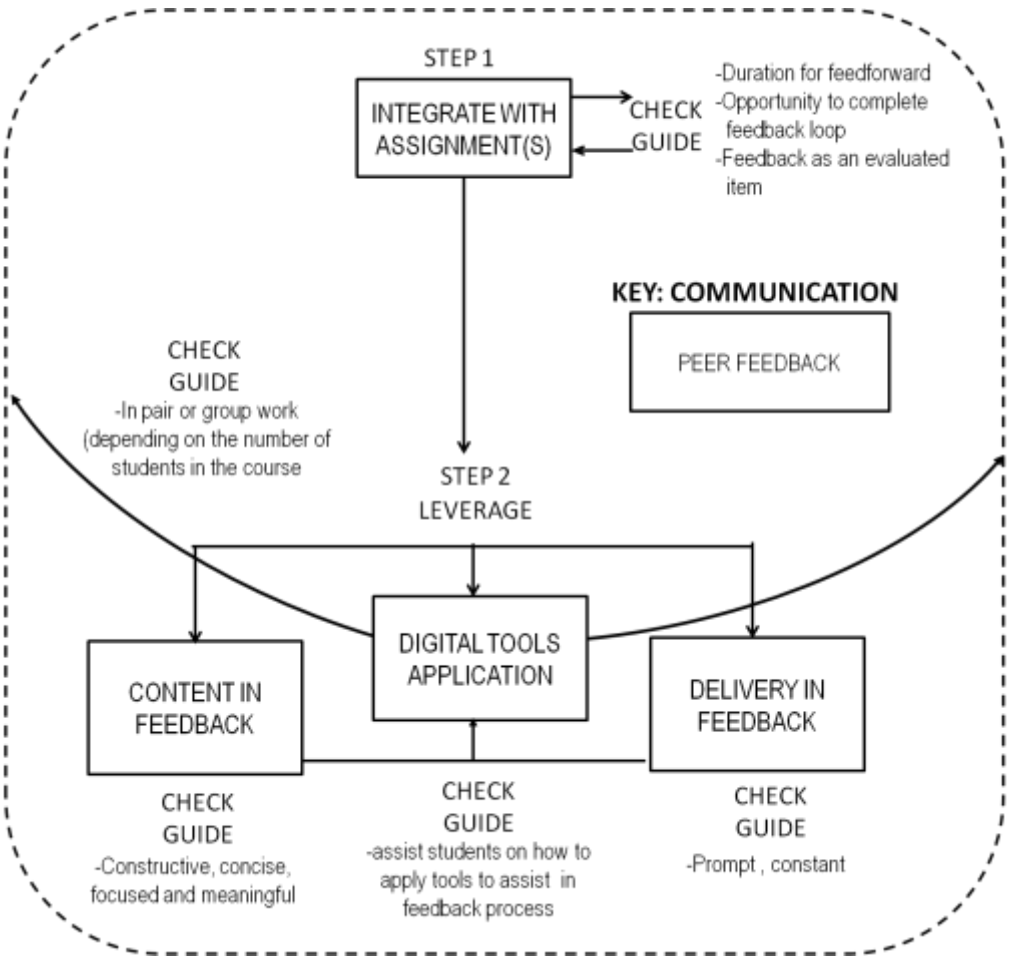


Figure 6.2 Strategies for sustaining feedback in TILE

6.2.1 Research Question 1

After a semester of research in mobilizing the strategies for the purpose of sustaining feedback in TILE, it came to my attention that there is a strategy which needs to be carried out first. Only then, the other strategies would be rolled out in their role to leverage this strategy. Refer to Figure 6.2 on how the strategies are mapped out to sustain feedback in TILE.

*(a) **Step One***

The *first step* to be applied is integrating feedback as a part of the assignment(s). This step is very pertinent because feedback works best if used and applied. According to Juwah et al (2004), feedback should be systematically embedded in the curriculum

practices as a part of teaching and learning in higher education. For this reason, assignment is the apt platform to activate feedback. In that situation, the learners would be able to see the relevance of feedback. But one cannot forget the portrayal of feedback as a pedagogy tool for teaching and learning would be clear if the following three guidelines are checked: (1) duration for the students to digest feedback; (2) opportunity for the students to utilize and complete the feedback loop, and (3) feedback being an evaluated item.

In the matter of providing duration for feedforward, it is important to be aware of the amount of days which should be given for the students to digest feedback and subsequently, having sufficient time to utilize feedforward and complete the feedback loop. In other words, thorough planning on the assignments is necessary.

For the next guideline: feedback being an evaluative item, this step should be carried out with care depending on certain variables. For this study, the step was implemented with the purpose to ensure quality feedback among each learner. Another objective was also to make sure every student would be participating in the feedback process. This coercion was unavoidable as the lecturer wanted every student not to miss the important opportunity to benefit from the feedback process. It can be said that at this point, it is necessary to be cruel to be kind. To ensure a smooth process in this guide, the students need to be shown how to write feedback. One cannot assume this can be illustrated and accomplished within a three hours class. Bear in mind, writing feedback which qualifies as a learning tool requires a lot of thinking behind it. To begin, the students need to be told how the feedback is evaluated e.g. key phrases or statements which qualify as feedforward. Prior to that, the teacher or lecturer has to provide exemplars. Providing exemplars can be done consistently until the students are able to provide feedback which fulfills the requirement stated in the rubric. A workshop on how to write

feedback could also provide the help the students needed. Workshops should best be conducted at the beginning of the course.

(b) ***Step Two***

At the next level, *step two* would serve as a form of leverage to step one. Step two comprises of three elements; (1) Application of technology tools (2) Content in feedback and (3) Delivery of feedback. For the aspect-application of technology tools, it is without a doubt that the digital tools chosen have to have the characteristics to support the feedback process. From the findings, it is clearly shown that integration of technology tools brings forth the power the feedback. In other words, it is crucial to properly manage the integration of digital tools in the learning environment. Hence, it does not stop there. It is also essential to provide assistance to students on how to use the digital tools in sustaining feedback. During the study, I learnt that it is not advisable to assume that the students are very digital literate in the matters of feedback for teaching and learning just because they are Generation Y or X. On that account, it is vital to show the students how to use the chosen digital tools and their functions in the feedback process. It is also a reminder to mention this in the very first week of the course. With that, every student will be on the same page in terms of adopting the functions of the applied digital tools in the feedback process.

The other two elements; (1) Content of feedback and (2) Delivery of feedback, had been extensively researched and proposed and advocated for the objective of sustaining feedback. For this study, it goes without saying; both of these items have an influential role in the feedback process. Based on involvement and experience for this study, it was a challenging but not an impossible act to provide quality content while ensuring prompt and constant feedback. The challenge would be it takes up a lot of time to provide written feedback which comprised these qualities: constructive, concise,

focused and meaningful. One would ask if there is any other way to go around the issue. My reply would be "Not yet". At that moment, I did not question the challenge as I preferred to see it as a strategy which allows me to put forth my personal feedback. This was because every group in this study was different. This diversity needs divergent feedback. Another follow-up question would be, "How would you be giving feedback to every student in the class?" In the context of individuality, for this study, it was a large class of 75 students. For this situation, the method of peer feedback was capitalized.

i Peer feedback

The element of peer feedback was neither in Step 1 nor Step 2. As shown in Figure 32, peer feedback is set as the environment for the strategies to sustain feedback. The key to sustaining feedback in TILE is communication. It has come to the realization that to increase the effectiveness of feedback, feedback has to be conceptualized as a dialogue (Juwah et al, 2004). The push to iterative feedback is to make students provide feedback among each other. At the same time, the students would assume some ownership in the role of giving feedback. Being trusted in this role allows the students to develop the skill of judgment. One also cannot dismiss that students are often better than the teacher in explaining to their peers in their language which is more accessible. This can be accomplished by including the element in Step 1 in which the assignments are designed to accommodate peer feedback. In this study, peer feedback was further pushed in a form of group work. Peer feedback needs a vehicle and one has to pave a road without boulders for a smooth experience. The role of digital tools comes into play. For the intent to sustain feedback in TILE, the students have to be provided with a variety of outlet to communicate feedback such as using chat messenger tool, email and

online forum. Do take note that if the feedback information is not turned into action soon after it is created, then it will be a missed opportunity.

6.2.2 Research Question 2

There were challenges which occurred during the study (described in Chapter 5). With the challenges, come the reminders of what to avoid. One of the challenges was the time factor. The students had problems when they were asked to provide feedback every week for the reflection assignment. The issue of time factor stem from the fact that they were taking other courses during that semester. There were other assignments which needed to be completed. The amount of feedback requested from every student was ten. It was not downhill from there as there were students who accomplished that number. The number of students was not big; one third of seventy-five students were able to fulfill the requirement of providing quality feedback to their peers. If a lecturer or teacher intends to replicate this method, follow the adage "less is more". I would ask the students to produce five feedbacks instead.

Another challenge was students fell into arguments over misinterpreted feedback from their peers or even deleting feedback which they find not favorable. I would say this situation need not be avoided and could be used to the students' advantage. This is because it helps the students to understand the "real world" of feedback. The phrase "real world" in feedback refers to situations such as feedback can sometimes be misunderstood, feedback need to be coined appropriately to help another, giving feedback while trying not to offend another person's feelings. It was with regret it happened without realizing it. In my opinion, being unaware of it can be seen as a double edged sword. The other edge was there is no interference from the lecturer and tutors. Hence, the students learnt how to sort the differences among themselves. On the

other side of the sword, it was a missed opportunity not to educate all the students on the issue.

6.3 Implication of the research findings

There are implications for practice in the findings of this research. The implications apply to both the design of sustaining feedback in the higher education sector and its implementation in TILE.

Firstly, the design of the strategies in sustaining feedback should capitalize the element of social constructivism. Individual based strategies will not be able to bring forth the power of feedback.

Secondly, it is imperative to build and cement the feedback process in the coursework. This will illustrate the value of feedback towards students' learning.

Thirdly, it is also crucial to include instructions on how to apply the technology tools in the feedback process in TILE. This is proven to be effective in assisting the students on charting their feedback based-learning in TILE.

Last but not least, the lecturers or practitioners are suggested to be actively involved in the implementation of the strategies. It is advisable for lecturers to provide assistance to students as they steer their way to accumulate feedback-based learning in TILE, not by supplying the solution, but by giving sufficient guidance—the 'scaffolding'—to take them to the next stage.

6.4 Recommendations for future research

Due to the limitation and delimitation of the study, it is hoped that other researchers would research into this topic. The next step would be to recommend these aspects to be researched upon:

6.4.1 Evaluated feedback in assignment(s)

The students for this course were teacher trainees. Hence, feedback being evaluated in assignments was relevant to their profession. There are other courses of other profession which do not require this criterion.

Aspect to be researched:-

1. Is feedback being an evaluated item in the assignments would be the effective strategy in sustaining the feedback process?
2. What are the critical elements in leveraging feedback as an evaluated item in the assignments?

6.4.2 Written feedback in TILE

In this study, written feedback was disseminated by the lecturer and tutors in a large class via digital tools. There is also unavoidable and common situation which a large class is single-handedly managed by one lecturer or teacher. For this issue, the following research questions are suggested to be probed.

Aspect to be researched:-

1. What factors would assist the lecturer or teacher in the written feedback process for a large class?

2. How does peer feedback facilitate the written feedback process for a large class?

6.4.3 Workshop and exemplars

As found in the questionnaire, the students requested workshop to assist in the process of writing feedback.

Aspects to be researched:-

1. Does providing workshops for writing feedback facilitate the feedback process?
2. What aspects in the workshop for writing feedback will assist the students in the feedback process?

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APPENDICES

Appendix A

ePortfolio assignment question

Referenced p.54

ASSIGNMENT 1: My Google Sites-ePortfolio – ongoing assignment (20%)

An ePortfolio is an electronic portfolio of acquired learning – knowledge, skills and abilities acquired through formal, non-formal, informal, accidental and incidental learning. The ePortfolio is currently defined as "a collection of authentic and diverse evidence, drawn from a larger archive representing what a person or organization has learned over time on which the person or organization has reflected, and designed for presentation to one or more audiences for a particular rhetorical purpose"

(ePortfolio Portal, 2004 taken from *(National Learning Infrastructure Initiative, 2003)*

Your task is to create and manage your own e-portfolio using GOOGLE SITE (https://sites.google.com/?). You have to sign-up as a GMAIL member. Below is the list of items which needed to be done for an e-portfolio and the criteria for evaluation.

Objectives	**GOOGLE SITE PAGES**	**WEEK/Duration**	**DESCRIPTION of TASK**
About oneself, philosophy and goals in life – 4%	ABOUT ME	WEEK 1 / 1 day	In this section, please provide a brief description of yourself which includes setting obtainable or realistic goals in attaining what you need. You also need to have a separate page on your teaching philosophy which defines the standard of you being an individual in your profession
**Reflection on learning (ASSIGNMENT 2)	REFLECTION/JOURNAL	ONGOING	In this aspect, you are to write your WEEKLY reflections on what we are learning, ie. about technology in teaching and learning. You can also evaluate your own thinking in relation to what you are learning. You are also to include the progress of your given assignment in your reflection.
Personal knowledge management – 8 %	VIDEOS (YOUTUBE/Google video) PHOTOS (PICASA) BLOG	ONGOING	This component will allow you to have the chance to manage learning e.g. categorize the artifacts (resources, links and written communication) according to the theme/importance, present the

			artifacts whereby peers can learn and apply, facilitate the accumulation of artifacts shared within a social networks or peers and provide easy access to the artifacts
Demonstrate competency in learning – 8 %	GROUPS VIDEOS (YOUTUBE/Google video) PHOTOS (PICASA) LINKS	ONGOING	In this section, you can display your learning proficiency (1) through end-product(s) (2) a series of processes / development until the final level (end-product)

Your portfolio will also be constantly monitored and evaluated on these aspects:

1. Selection of artifacts (resources, links e.g YouTube and written communication- pdf, doc, ppt) related to the subject
2. Use of multimedia e.g. photos and videos related to the subject
3. Your feedback on your friends' artifacts
4. Frequent update on your artifacts

You are allowed to try other modules/widgets/applications which can help enhance and add value to your e-portfolio.

REMINDER to: Add your 74 friends and facilitators (tutors, lecturer) in your network

Appendix B

Reflection assignment question

Referenced p.63

ASSIGNMENT 2: REFLECTION – ongoing assignment (20%)

Objectives	GOOGLESITES FEATURES	WEEK/Duration	DESCRIPTION of TASK
**Reflection on learning (ASSIGNMENT 2)	ANNOUNCEMENT (REFLECTION/JOURNAL)	ONGOING	In this aspect, you are to write your WEEKLY reflections in relation to what we are learning about technology in teaching and learning. You can also evaluate your own thinking in relation to what you are learning. You are also to include the progress of your given assignment in your reflection.

Examples of reflection:

1. Observation of a lesson
2. Evaluate the progress of an ongoing activity / assignment, your struggle during the process
3. Imaginative speculation - Imagining alternative ways of thinking on an issue in order to provide an opportunity to challenge our existing ways of knowing and acting

Your reflection will be evaluated on these aspects:

1. Weekly reflection
2. *Feedback on your peers' reflection. The type of feedback should not be limited to such "Good writing OR great work OR keep it up etc" Feedback/comments can be questions on the subject mentioned, a disagreement, OR adding extra information to the current reflection.
3. Your feedback in reply to your peers'/ facilitator(s) comment on your reflection

In total, you will have a minimum of 14 reflections. You are encouraged to write more if you want to write more than then the stated number.

As for feedback, you are to give feedback within the allocated bundle. You are to give a minimum of 10 feedback (of no.2 type*) among your BUNDLE every week.

BUNDLE 1 (GROUP 1 – GROUP 5)

BUNDLE 2 (GROUP 6 – GROUP 10)

BUNDLE 3 (GROUP 11 – GROUP 15)

If you want to give feedback (after the minimum number of 10) to other BUNDLES, you are allowed to do so.

Appendix C

ETOYS assignment question

Referenced p.65

ASSIGNMENT 3: E-TOYS_KIT with Brennan (20%)

Please read the assignment question carefully

Design and create an ETOYS (ETs)-package in your chosen subject based on the chosen principle from the Brennan learning Principles.

The main item of the ETOYS *(ETs)* - package is the ETOY. Next create resources/materials to support the eToys.

ON ETOYS

Decide on what is manageable and reasonable for the eToys. The idea is for you to deliver a message and make an impact. First think of the problems that you would like to have the eToys as the solution.

Here are also some questions to ask before you make the *(ETs)*

- *What is the objective, how does the ETs meet the objectives or the learning outcomes?*
- *Is it suitable to have the ETs when the content can be delivered easily with a demonstration or a picture or book?*
- *How is the ETs going to be useful for the teachers and the students?*
- *Would you need to prepare handouts or guidelines on how to use the ETs?*
- *Is the ETs going to be used before the lesson, during the lesson or after the lesson?*
- *Can the ETs be used on its own or does it need to be integrated in specific activities?*
- *What do you want the students or the teacher to do with the ETs?*
- *Is the purpose of the ETs to inform, to instruct, or to get the viewers to do something?*

Think of the target audience and consider their preferences for images, sound, color etc, which will help you to decide on the strategies to take before you create the *ETs*.

At the end of the assignment, your *ETs* will be uploaded by the tutors in ETOYS website to measure how effective the designed *ETs* based on the ratings or comment.

Time line of your eToys package assignment

Week 3 (27 July – 03 Aug 2010):

The objective of the eToy

Title of the eToy

Announce the details in the PKEY 3101 group WINDOWS-Subgroups.

You are allowed to proceed once your submission is approved by your respective tutor.

NOTE: You are allowed to change the objective and the title of the eToys even after you have submitted before. **INFORM your respective TUTOR on the change.**

Week 4 (03 Aug – 10 Aug 2010):

Progress of story board for eToy

If you have any problems, please post your problems at Assignment03: QnA

Week 9 (22 Sept 2010):

Submission of eTs in the Spectrum-PKEY3101 platform

The eTs file (.pr) should be labelled as your matric no. followed by underscore A3ets
e.g PGC050008_A3ets

Next upload your eTs in A3 folder at eToys GROUP

Your description for the uploaded eTs should include:-

- Short description of your eToy (no more than 50 words) in .doc format

Week 10 – Week 13:

Preparation of the supporting materials

Package the eTs and supporting materials into a kit

Week 14 – 27 October 2010:

Submission of ETOYS Package KIT and written report (documentation) in CD

The CD should have FOLDERS with each FOLDER labeled with the student's Matric no.

In the FOLDER, there are TWO sub FOLDERS (1) Etoys and supporting materials FOLDER (2) report file FOLDER

The Etoys and supporting materials FOLDER should be labelled as your matric no. followed by underscore A3ets_materials e.g PGC050008_A3ets_materials

The report folder should be labelled as your matric no. followed by underscore A3report

e.g PGC050008_A3report

Your written report should include:-

1. Objectives & Learning Outcomes of the ETOYS PACKAGE KIT

2. Describe how the eTs and the supporting materials can be used in the intended class.

Appendix D•

Sample recap

Referenced p.73

ATTN:Recap PKEY3101 Class no.7

HUEY ZHER NG ✆ to adah6697, aimerulhaidhar, aisyahpeh08002, annukman, ariffms88, ashzizou, azriansaiyuki88, beqi88, bradersnyper, chekguemah, chrispinadam87, ckynabdullah, damnikrain, dbskislove4eva, dhachainiprabh., eija21011988, eikakakak, emmafehrian, faiz.shakri, faizalbindarman, farahusna24, farizul23, fatin108, fikriey88ander., floratanpy, freakynaz

show details 8/25/10

Dear PKEY-ians

REMINDER:Please read the email thoroughly. No selective OR jump-skip reading. It is noted that some of them are not reading thoroughly which resulted in incomplete entry.

We hope you enjoyed and take something back from today's lesson: M-LEARNING.

A recap on today's lesson:-

You have learnt about M-learning.

Aspects listed below were covered:

What is MLearning

Why MLearning

How MLearning

When MLearning

Where MLearning

To answer some of the questions, you in a group were asked to create a podcast that could be used for your primary school students on a selected story or poem.

You were given an hour to create the podcast and it was great to see each group were able to create a podcast (despite the mishaps of software and noisy environment) It was unfortunate that we cannot listen to all groups but we will later in your googlesites.

Anyway, you were also asked to bring your camera. The purpose to take photos of the training. It seems you are still not use to doing that yet.

Why take photos of event such as this?

- To show what you have done (as many has mentioned in their feedback , they will be using GOOGLESITES after this semester)

- To provide better description to your entry

- With those two, you can show your future employer the most complete CV. It is difficult to compress everything in ONE CV. Therefore the portfolio. Imagine if you start taking photos of events/training/activities (be it in Uni or out of Uni) that you have attended, by the time you graduated, you will have the most comprehensive CV!

So those who have taken the photos, please share with your group as we want to see those photos up in this week entry.

Next this week task:-

Reflection on 25th Aug:

Reflection on mobile learning (dateline next Wednesday, 01092010)

(1)Your learning experience in today's workshop

(2)the opportunities that you think may benefit you as a university student. (Sub-Topic Mobile Learning Reflection)

(3)Go through at least one software on mobile learning (see attachment) Please reflect on how you could use the software as a student. The list of suggested software to explore is in the mobile learning powerpoint. (Sub-Topic:Mobile Learning Software Reflection)

These two sub-topics are under 1 blog post entitled:MOBILE LEARNING but must be divided under two separate titles as per the above

Next: The one podcast which you have created today (as a group) for the children, please upload the completed podcast in a NEW PAGE at your GOOGLESITES. You can name the PAGE as PODCAST resource. Give a short description on the uploaded PODCAST on what is the PODCAST about how the PODCAST can be used in a lesson (not more than 200 words)

PODCAST ACTIVITY

Create at least one podcast on a topic relevant to the course e.g. TPACK, BRENNAN principles etc (maximum 2 minutes). Give a short description on the uploaded PODCAST (not more than 50 words). The whole purpose of this podcast is for you to create a revision audio file which you can hear in your spare time. You can download your friend's podcast to hear their notes.

This is one method that you can use podcast for. Upload the podcast in the newly created GOOGLESITES page: PODCAST resource.

Dateline: 20 SEPTEMBER 2010

-end-

If you have any questions, you know where to look for us

With regards,

Your team of facilitators

Appendix E

Questionnaire given on Week 14

Referenced p.89

Questionnaire-Feedback

PKEY3101:ICT IN PRIMARY EDUCATION

Dear all, throughout the course, you were given feedback in many forms; weekly email to the class, feedback via Facebook chat and message, feedback via spectrum platform, feedback via chat tools e.g. Yahoo Messenger and MSN, face-to-face feedback during class while some did also received feedback in podcast format. We would like to know your answers to the following questions.

Please circle the most appropriate answer using the scale:
1-Never 2-Rarely 3-Sometimes 4-Often 5-Always

1. **How frequent did your receive feedback from the lecturer/tutor's during the course?**
   a. Face-to-face 1 2 3 4 5
   b. Written Email via gmail / facebook message 1 2 3 4 5
   c. Chat via Yahoo messenger or MSN or Facebook chat 1 2 3 4 5
   d. Podcast 1 2 3 4 5
2. How frequent did you receive feedback from your peers during the assignments (group or individual)? 1 2 3 4 5
3. How frequent did you receive feedback from your peers for each of your entry in GOOGLESites? 1 2 3 4 5
4. How frequent did you give feedback to your peers during the assignments (group or individual)? 1 2 3 4 5

Please circle the most appropriate answer using the scale: 1-strongly disagree 2-disagree 3-neutral 4-sagree 5-strongly agree

A. Quantity and timing of feedback

a.	I was given feedback at the start of the course.	1	2	3	4	5
b.	On this course I get plenty of feedback on how I am doing.	1	2	3	4	5
c.	The feedback comes back very quickly.	1	2	3	4	5
d.	There is hardly any feedback on my assignments when I get them back.	1	2	3	4	5
e.	When I get things wrong or misunderstood them I don't receive much guidance on what to do about it.	1	2	3	4	5
f.	I would learn more if I received more feedback.	1	2	3	4	5
g.	Whatever feedback I get comes too late to be useful.	1	2	3	4	5

B. Quality of feedback

a.	The feedback mainly tells me how well I am doing in relation to others.	1	2	3	4	5
b.	I was given detailed feedback that helped me improve my assignments	1	2	3	4	5
c.	I was given feedback on my learning progress throughout the course.	1	2	3	4	5
d.	The feedback helps me to develop my intellectual skills.	1	2	3	4	5
e.	The feedback helps me to understand specific course content.	1	2	3	4	5
f.	The feedback shows me how to do better next time.	1	2	3	4	5
g.	Once I have read the feedback I understand why I have to redo the assignment.	1	2	3	4	5
h.	I don't understand some of the feedback.	1	2	3	4	5
i.	I can seldom see from the feedback what I need to do to improve.	1	2	3	4	5

C. What you do with the feedback

a.	I read the feedback carefully and try to understand what the feedback is saying.	1	2	3	4	5
b.	I use the feedback to go back over what I have done in the assignment.	1	2	3	4	5
c.	The feedback does not help me with any subsequent assignments in this course.	1	2	3	4	5

d. The feedback does not help me with assignments from other courses. 1 2 3 4 5

e. The feedback prompts me to go back over materials covered earlier in the course. 1 2 3 4 5

f. I do not use the feedback for revising. 1 2 3 4 5

Comments you would like to make about the way these forms of feedback affected your learning throughout the course.

Feedback (e.g. written email, chat, podcast, face to face, comments on Googlesites) between you and the lecturer/tutor

Feedback between you and your peers

Scale: 1-nothing at all 2-very little 3-little 4-much 5-very much

1. How much have you learnt from the feedback given by your peers? 1 2 3 4 5

Justify based on the scale you have chosen.

2. From the start until the end of the course, how much have you learnt from being the feedback giver? 1 2 3 4 5

Justify based on the scale you have chosen.

What are the problems / challenges which you have experienced during the feedback activities throughout the course?

What suggestions do you have for us to improve the feedback activities and experience in the course?

Appendix F

Assessment Experience Questionnaire (AEQ)

Referenced p.90

Assessment Experience Questionnaire (AEQ)

Please answer every item quickly by giving your immediate response.
Circle the appropriate code number to show your response to assessment.

	strongly disagree	disagree	?	agree	strongly agree
1 Amount and distribution of study effort					
I do the same amount of study each week, regardless of whether an assignment is due or not.	1	2	3	4	5
I can be quite selective about what I study and learn and still do well.	5	4	3	2	1
I only study things that are going to be covered in the assignments.	5	4	3	2	1
I have to study regularly if I want to do well on the course.	1	2	3	4	5
On this course, it is possible to do quite well without studying much.	5	4	3	2	1
In weeks when the assignments are due I put in many more hours.	5	4	3	2	1
2 Assignments and learning					
Tackling the assignments really makes me think.	1	2	3	4	5
I learn more from doing the assignments than from studying the course material.	1	2	3	4	5
In completing the assignments you can get away with not understanding and still get high marks.	5	4	3	2	1
The assignments give very clear instructions about what you are expected to do.	1	2	3	4	5
When I tackle an assignment it is not at all clear what would count as a successful answer.	5	4	3	2	1
The assignments are not very challenging.	5	4	3	2	1
3 Quantity and timing of feedback					
On this course I get plenty of feedback on how I am doing.	1	2	3	4	5
The feedback comes back very quickly.	1	2	3	4	5
There is hardly any feedback on my assignments when I get them back.	5	4	3	2	1
When I get things wrong or misunderstand them I don't receive much guidance in what to do about it.	5	4	3	2	1
I would learn more if I received more feedback.	5	4	3	2	1
Whatever feedback I get comes too late to be useful.	5	4	3	2	1

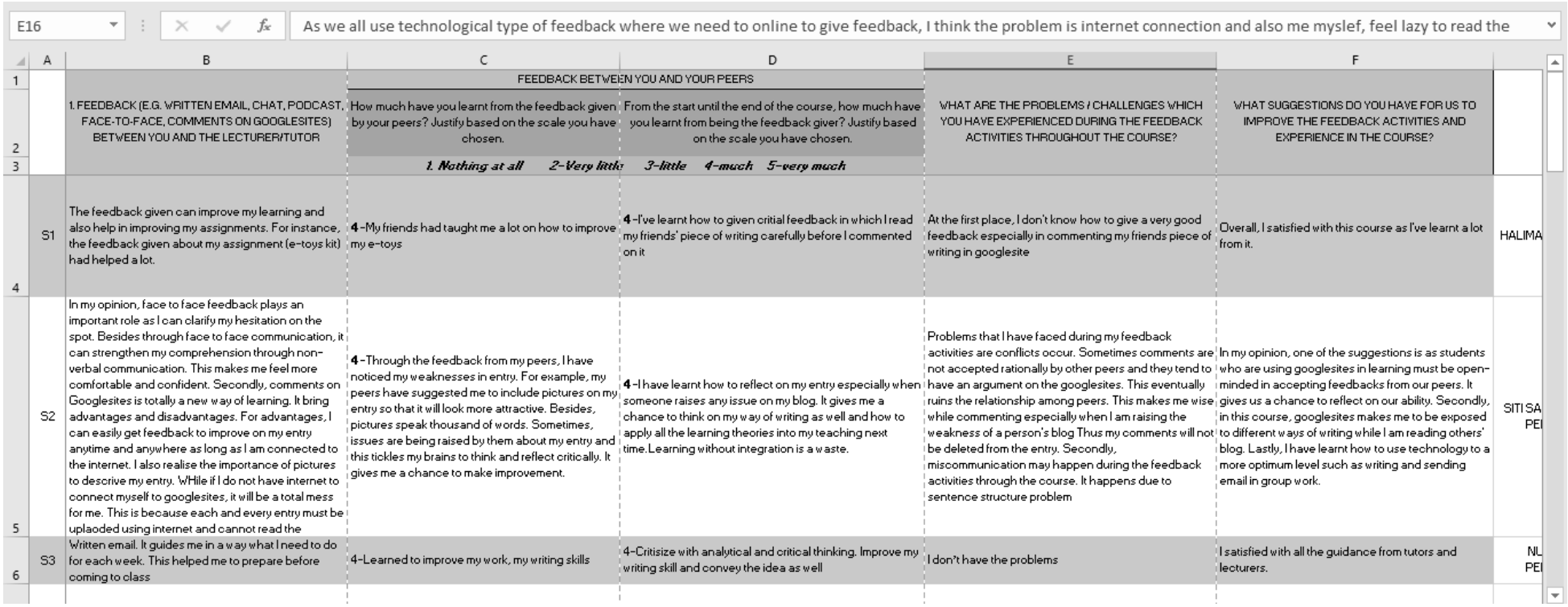
	strongly agree	agree	?	disagree	strongly disagree
4 Quality of feedback					
The feedback mainly tells me how well I am doing in relation to others.	5	4	3	2	1
The feedback helps me to understand things better.	1	2	3	4	5
The feedback shows me how to do better next time.	1	2	3	4	5
Once I have read the feedback I understand why I got the mark I did.	1	2	3	4	5
I don't understand some of the feedback.	5	4	3	2	1
I can seldom see from the feedback what I need to do to improve.	5	4	3	2	1
5 What you do with the feedback					
I read the feedback carefully and try to understand what the feedback is saying.	1	2	3	4	5
I use the feedback to go back over what I have done in the assignment.	1	2	3	4	5
The feedback does not help me with any subsequent assignments.	5	4	3	2	1
The feedback prompts me to go back over material covered earlier in the course.	1	2	3	4	5
I do not use the feedback for revising.	5	4	3	2	1
I tend to only read the marks.	5	4	3	2	1
6 The examination and learning (only to be completed if there is an exam)					
Preparing for the exam was mainly a matter of memorising.	5	4	3	2	1
Doing the exam brought things together for me.	1	2	3	4	5
I learnt new things while preparing for the exam.	1	2	3	4	5
I understand things better as a result of the exam.	1	2	3	4	5
I'll probably forget most of it after the exam.	5	4	3	2	1
In the exam you can get away with not understanding and still get good marks.	5	4	3	2	1

Comments you would like to make about the way the assessment affected your learning on the course

Appendix G

Sample of Questionnaire Data transcribed in Microsoft Excel

Referenced p.98



E16 | As we all use technological type of feedback where we need to online to give feedback, I think the problem is internet connection and also me myslef, feel lazy to read the

	A	B	C	D	E	F	
1			FEEDBACK BETWEEN YOU AND YOUR PEERS				
2		1. FEEDBACK (E.G. WRITTEN EMAIL, CHAT, PODCAST, FACE-TO-FACE, COMMENTS ON GOOGLESITES) BETWEEN YOU AND THE LECTURER/TUTOR	How much have you learnt from the feedback given by your peers? Justify based on the scale you have chosen.	From the start until the end of the course, how much have you learnt from being the feedback giver? Justify based on the scale you have chosen.	WHAT ARE THE PROBLEMS / CHALLENGES WHICH YOU HAVE EXPERIENCED DURING THE FEEDBACK ACTIVITIES THROUGHOUT THE COURSE?	WHAT SUGGESTIONS DO YOU HAVE FOR US TO IMPROVE THE FEEDBACK ACTIVITIES AND EXPERIENCE IN THE COURSE?	
3			*1. Nothing at all 2-Very little 3-little 4-much 5-very much*				
4	S1	The feedback given can improve my learning and also help in improving my assignments. For instance, the feedback given about my assignment (e-toys kit) had helped a lot.	**4**-My friends had taught me a lot on how to improve my e-toys	**4**-I've learnt how to given critial feedback in which I read my friends' piece of writing carefully before I commented on it	At the first place, I don't know how to give a very good feedback especially in commenting my friends piece of writing in googlesite	Overall, I satisfied with this course as I've learnt a lot from it.	HALIMA
5	S2	In my opinion, face to face feedback plays an important role as I can clarify my hesitation on the spot. Besides through face to face communication, it can strengthen my comprehension through non-verbal communication. This makes me feel more comfortable and confident. Secondly, comments on Googlesites is totally a new way of learning. It bring advantages and disadvantages. For advantages, I can easily get feedback to improve on my entry anytime and anywhere as long as I am connected to the internet. I also realise the importance of pictures to descrive my entry. WHile if I do not have internet to connect myself to googlesites, it will be a total mess for me. This is because each and every entry must be uplaoded using internet and cannot read the	**4**-Through the feedback from my peers, I have noticed my weaknesses in entry. For example, my peers have suggested me to include pictures on my entry so that it will look more attractive. Besides, pictures speak thousand of words. Sometimes, issues are being raised by them about my entry and this tickles my brains to think and reflect critically. It gives me a chance to make improvement.	**4**-I have learnt how to reflect on my entry especially when someone raises any issue on my blog. It gives me a chance to think on my way of writing as well and how to apply all the learning theories into my teaching next time.Learning without integration is a waste.	Problems that I have faced during my feedback activities are conflicts occur. Sometimes comments are not accepted rationally by other peers and they tend to have an argument on the googlesites. This eventually ruins the relationship among peers. This makes me wise while commenting especially when I am raising the weakness of a person's blog Thus my comments will not be deleted from the entry. Secondly, miscommunication may happen during the feedback activities through the course. It happens due to sentence structure problem	In my opinion, one of the suggestions is as students who are using googlesites in learning must be open-minded in accepting feedbacks from our peers. It gives us a chance to reflect on our ability. Secondly, in this course, googlesites makes me to be exposed to different ways of writing while I am reading others' blog. Lastly, I have learnt how to use technology to a more optimum level such as writing and sending email in group work.	SITI SA PE
6	S3	Written email. It guides me in a way what I need to do for each week. This helped me to prepare before coming to class	4-Learned to improve my work, my writing skills	4-Critisize with analytical and critical thinking. Improve my writing skill and convey the idea as well	I don't have the problems	I satisfied with all the guidance from tutors and lecturers.	NU PE

APPENDIX I

Appendix H

Sample of Interview Data transcribed in Microsoft Word

Referenced p.98

Transcript 1

Online interview - Student Flora

1	S	hi Ms Jess. sorry, i'm only back now	
2	I	Hello Flora. Taken ur dinner?	
3	S	yup ^^. as at church earlier	
4		so how can i help you with your research? ^^	
5	I	need your experience	
6	S	about me giving feedback?	
7	I	here is the question: Based on your experience, how do	
8		you learn in the environment (pkey3101) where feedback	
9		is sustained and stimulated?	
10		take ur time to answer this	
11		no hurry	
12	S	wat do u mean by "feedback is sustained and	
13		stimulated"?	
14	I	when you were in pkey3101 class, in your opinion was	
15		the feedback process smooth and continous (sustained)?	
16		until the end of the class?	
17		As for feedback that is stimulated--the feedback was	
18		being injected with relevant information to help the	
19		students.	
20	S	In terms of feedback being sustained - it was continuous	
21		throughout pkey3101 class because there was a system	
22		where we are required to read other people's reflections	
23		and give comments. Of course, some comments didn't	
24		really sound like feedback because some people were	
25		beating around the bush, some gave comments that were	
26		not related to what they read at all, but for me, it was	
27		pretty interesting to read what people write as their	
28		feedback, whether it's related or not. Also, lecturers did	
29		give their comments too, which was constructive as it	
30		helped me to improve in certain areas or to ponder on a	
31		different thought.	
32		In terms of feedback being stimulated - like I mentioned	
33		earlier, some were useful to help improve myself, but	
34		some I didn't understand what they were saying. I'd read	
35		and then go, "Ok... so what does that mean?" This	
36		mainly comes from peer's feedback as I guess some do	
37		not know what to write so they put their comments there	
38		just for the sake of marks. But I really appreciate	
39		feedback that made me think of a problem / issue from a	
40		different perspective. I believe there is always different	
41		ways of viewing an issue and I will definitely overlook	
42		some of it, which is why I find feedback useful in this	
43		sense because it reminds me of the other perspectives.	
		Based on your interpretation, narrate your experience,	
		how do you learn in the feedback environment	
44	I	(pkey3101)	
45		Basically, I learn from peers and lecturers. Whenever	
46		anyone commented on whatever I wrote, I read and tried	
47	S	to understand their angle. Some were enjoyable read,	
48		some were encouraging, some were constructive when	
49		they wanted to point out certain things which I	
50		overlooked. Of course, there was one time when I put up	
51		a draft of the e-toys project and there were repeating	
52		comments of the same thing given by different people.	
53		That kind of irked me because I thought I'd read	
54		something different from the next person who	
55		commented. In the end, I kind of replied in an unfriendly	
56		manner and that nearly resulted in an argument. Of	
57		course it was resolved after that, but that made me realise	
58		I really need to be a lot more open-minded to be able to	
59		receive any form of feedback.	
60		What is the one word/phrase which can represent on how	
61		you learn in the feedback environment?	
61	I	opening of the mind ^^	
63		Were you able to use the received feedback for other	
64	S	classes / subject? Tell me more.	
65	I	On the whole, I'd say yes because feedback that I	
66		received did help me improve in my writing and that	
67	S	helped me to better express myself in other classes. I	
68		could elaborate better and try to think of different	
69		perspectives, especially in classes where it requires some	
70		kind of prediction-making on my part. For example in	
71		my final sem, one of the courses (Future studies of	
72		English) required us to somewhat predict how the future	
73		of English language would be, whether it'd still be	
74		reigning as the international and number 1 language or	
75		will it be replaced by other rising languages. So when it	
76		comes to this kind of question, I learn to consider	
77		different views of different area for instance in the area	
78		of communication, economy and others. Previously, I'd	
79		only focus on probably 1 or at most 2 areas, but now I	
80		learn to also look at a few others.	
81		How about the information received via feedback during	
82		pkey3101 class?	
83	I	Was there any application of that knowledge in other	
84		classes/subject/teaching practical?	
85		Tell me more.	
86			

Appendix I

Sample of Questionnaire Data coded in Microsoft Excel

Referenced p.98

1	1. What instructional strategies will stimulate and sustain feedback in a technology integrated learning environment			
2	**THEME**	**INSTRUCTIONAL STRATEGIES for sustainable FB in TILE**	**REMARK**	**OUTCOME (DATA from questionnaire)**
3	**Provide opportunities to act on feedback (to close any gap between current and desired**	*providing various tools as bridges for feedback to move around (IS?) Tools-email (mailing list), forum-discussion on LMS platform, googlesite, chat tool. Each tool support social / community learning.*		
4	**Support the development of learning groups and learning communities** LGC			
5				
6	*EXCERPT FROM QUESTIONNAIRE*			
7	In my opinion, **face to face feedback** plays an important role as I can **clarify my hesitation on the spot**. Besides through face to face communication, it can strengthen my comprehension through non-verbal communication. This makes me feel more comfortable and confident. Secondly, **comments on Googlesites** is totally a new way of learning. It bring advantages and disadvantages. For advantages, I can **easily get feedback to improve on my entry anytime and anywhere as long as I am connected to the internet**. I also realise the importance of pictures to descrive my entry. WHile if I do not have internet to connect myself to googlesites, it will be a total mess for me. This is because each and every entry must be uploaded using internet and cannot read the comments given by lecturers.			
8				
9	**Written email**. It **guides me** in a way **what I need to do for each week**. This helped me to **prepare before coming to class**			
10				
11	Sometimes **feedback through email** could bring some issue as **not everyone like to view their email daily.** It is **better to give feedback via facebook**			
12				
13	For me, the best way to give feedback are through email and comments on Googlesites			
14				
15	All the feedbacks given through email really helps in for learning. Sometimes, **during class we are not able to catch up what have been taught so by reading the email, it does helps.**			
16				
17	Feedback is a good way to improve our learning process. As for me, feedback is good **when we can share to each other**.			
18	So, the best medium that **we can apply is by using Facebook rather than e-mail**. Everybody may view the feedback too, indirectly, will help them to be more better too.			
19				
20	It is good and to get feedback from various forms. It is because it **helps me to be on the right track along the course**			
21				
22	Actually I more prefer comment via **googlesites and face-to-face**. This is because most of the time I open my googlesites			

Appendix J

Sample of Questionnaire Data sub-coded in Microsoft Words

Referenced p. 98

SAMPLE CODING

EXTRACT FROM QUESTIONNAIRE

THEME	INSTRUCTIONAL STRATEGIES for sustaining FB in TILE	OUTCOME (DATA from questionnaire)
Provide opportunities to act on feedback (to close any gap between current and desired performance) OA	*providing various tools as bridges for feedback to move around (IS?) Tools:- email (mailing list), forum-discussion on LMS platform, googlesite, chat tool. Each tool support social / community learning.*	
Support the development of learning groups and learning communities LGC		

In my opinion, **face to face feedback** (FTF) plays an important role as I can **clarify my hesitation on the spot (T1)**. Besides through face to face communication, it can strengthen my comprehension through non-verbal communication. This makes me feel more comfortable and confident. Secondly, **comments on Googlesites** is totally a new way of learning. It bring advantages and disadvantages. For advantages, I can **easily get feedback to improve on my entry anytime and anywhere as long as I am connected to the internet (T2)**. I also realise the importance of pictures to descrive my entry. While if I do not have internet to connect myself to googlesites, it will be a total mess for me. This is because each and every entry must be uploaded using internet and cannot read the comments given by lecturers.	FTF T1-OPPORTUNITY CLOSE GAP ONLINE TOOL: GOOGLESITES T2-CONVENIENT
Written email. It **guides me** in a way **what I need to do for each week (T3)**. This helped me to **prepare before coming to class (T4)**	ONLINE TOOL: EMAIL T3-AS A GUIDE T4-PREPARE BEFORE CLASS
Sometimes **feedback through email** could bring some issue as **not everyone like to view their email daily.** It is **better to give feedback via facebook (EXTRA)**	ONLINE TOOL: EMAIL *EXTRA: NOT EVERYONE PREFERS DAILY EMAIL. PREFER FACEBOOK*
For me, the best way to give feedback are through email and comments on Googlesites	ONLINE TOOL: EMAIL, GOOGLESITES
All the feedbacks given through email really helps in for learning. Sometimes, **during class we are not able to catch up what have been taught so by reading the email, it does helps.**	T5:CATCH UP WHAT WAS MISSED IN CLASS
Feedback is a good way to improve our learning process. As for me, feedback is good **when we can share to each other**.	T6:FB WORKS IF CAN SHARE WITH EACH OTHER.

Appendix K

Consent form

Referenced p.101

CONSENT FORM

We will be using information, resources and online data from PKEY3101 class activities for research. We would like to seek your consent to allow us to use the information and data related to your learning activities in this course.

By signing this form, I, _____ (name), IC no (_____) give my consent to the lecturer and tutors to use any part of the PKEY3101 data and resources that I may have generated directly and indirectly to be used for research.

Signature: _____

Name: _____

Matrix no: _____

Date: _____