SELF-DIRECTED LEARNING IN AN E-SOCIOCONSTRUCTIVIST LEARNING ENVIRONMENT

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The only true wisdom is in knowing you know nothing." ― Socrates

Trotting the PhD journey is truly a humbling experience. Even with the completion of this thesis, there remains a revelation within me that I have but plunged into one tiny corner in the vastness of human knowledge.

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With eternal appreciation to my parents who gave me the priviledge of education and for believing in me as a unique individual.

With love to my hubby for staying by me and for enduring stressful moments together, not forgetting my children, the jewels in my heart, who have grown to be independent as a result of my prolonged engagement in research. It is my hope that you grow up to be wise and seek the love of learning, passionately and genuinely.

Certainly to my God – You are my strength when I am weak.

Synopsis

Adult learners need to equip themselves with skills to stay competitive in the changing work environment of the 21st century. The teaching and learning of adult learners ought to transition from the traditional didactic school of education to embrace self-directed and social forms of learning; which are the capstones of continuous lifelong learning (Raidal & Volet, 2009) and prerequisite to successful online learning (Shapley, 2000). This study proposes a conceptual framework of a mediated activity system in developing the e-socioconstructivist learning environment (eSCLE); which is a learner-centred environment incorporating the design of a physical and virtual learning space conducive for constructing knowledge and building upon existing knowledge in collaboration with others. The design of the eSCLE for self-directed learning is an attempt to promote learning that reflects the unstructured seamless nature of lifelong self-directed learning. The activity systems and the conditions that facilitate the development of self-directed learning in the context of a cohort of adult learners enrolled in an Instructional Design and Development Course is then examined. Findings from survey questionnaires, content analysis, observation and interview reveal systemic tensions faced by learners in self-directing their learning in the eSCLE. The conflicting situation must be managed with appropriate balance and discretion in order to facilitate the development of self-directed learning. Web-based technology integrated as mediating tools is able to scaffold self-directed learning in a collaborative manner; where the functional roles of both instructor and learner-determined web tools enable self-directed actions. This study provides methodological direction for the development of self-directed instructional design, providing a basis for the continuation of this line of research in future.

PEMBELAJARAN KENDIRI DALAM PERSEKITARAN PEMBELAJARAN E-SOSIOKONSTRUKTIVIS

Sinopsis

Pelajar dewasa perlu melengkapi diri mereka dengan kemahiran untuk terus berdaya saing dalam persekitaran kerja yang berubah-ubah dalam abad ke-21. Pengajaran dan pembelajaran pelajar dewasa sepatutnya beralih dari pendidikan tradisional yang didaktik untuk mendokong pembelajaran kendiri dan sosial. Ini kerana pembelajaran sedemikian membentuk asas pembelajaran berterusan sepanjang hayat (Raidal & Volet, 2009) dan menjadi pra-syarat kepada pembelajaran dalam talian yang berjaya (Shapley, 2000). Kajian ini mencadangkan satu rangka kerja konseptual berdasarkan sistem aktiviti berperantaraan dalam membangunkan persekitaran e-pembelajaran sosiokonstruktivis (eSCLE); iaitu satu persekitaran berpusatkan pelajar, yang menggabungkan reka bentuk ruang pembelajaran fizikal dan maya yang kondusif untuk membina pengetahuan dan menambah kepada pengetahuan sedia ada melalui aktiviti bekerjasama dengan individu lain. Aktiviti mereka bentuk eSCLE untuk pembelajaran kendiri ini merupakan satu kajian awal dalam menggalakkan pembelajaran yang mencerminkan ‘ketidak-strukturan’ pembelajaran kendiri berunsur sepanjang hayat, di mana sistem aktiviti dan syarat-syarat yang memudahkan pembelajaran kendiri dalam konteks kohort pelajar dewasa yang mengikuti Kursus Reka Bentuk Pengajaran dan Pembangunan kemudiannya dikaji. Penemuan daripada tinjauan soal selidik, analisis kandungan, pemerhatian dan temubual mendedahkan tekanan sistemik yang dihadapi pelajar dalam mengarahkan pembelajaran kendiri mereka dalam eSCLE. Beberapa aspek percanggahan dikenalpasti dalam penyesuaian diri sistem aktiviti. Dicadangkan situasi bercanggahan diurus dengan keseimbangan yang berpatutan dan mengikut budi bicara pengkaji atau pengajar demi memudahcara pembelajaran kendiri di kalangan pelajar. Juga didapati beberapa teknologi

berasaskan web, berdasarkan konsep alat perantara, dapat memudahcara pembelajaran kendiri melalui hubungan kolaboratif; dengan syarat alat web ditentukan oleh pengajar dan pelajar. Kajian ini menyediakan hala tuju metodologi untuk pembangunan reka bentuk pengajaran kendiri dan menyediakan asas bagi penyelidikan seumpama pada masa hadapan.

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List of Abbreviations

ADeC	Academic Development Centre
DDR	Design and Development Research
Em4En	Empowerment for Engagement
eSCLE	e-socioconstructivist learning environment
ID	Instructional Design
IDD	Instructional Design and Development
ILD	Integrative Learning Design
LC	Learning Contract
MIT	Master of Instructional Technology
Moodle	Modular Object-Oriented Dynamic Learning Environment
PBL	Problem-based Learning
PLE	Personal Learning Environment
PoPBL	Project-oriented Problem-Based Learning
PUSMAL	Pusat Usahawanan Siswazah Malaysia
R&D	Research and Development
SDL	Self-Directed Learning
SLT	Student Learning Time
SSDL	Staged Self-Directed Learning
T&L	Teaching and Learning
ZPD	Zone of Proximal Development

CHAPTER 1

INTRODUCTION

This chapter sketches an overview of the study by discussing the challenges of education in the global and local context which sets the milieu for the purpose of the study. The research questions are thence presented in view of the proposed conceptual framework and operational definitions of relevant terminology.

Background

The 21st century is characterized by the ubiquitous forces of globalization, which drives the existing knowledge-driven economy, the inter-connectivity and digital revolution. In this era, the amount of information increases exponentially each day, whilst the half-life of knowledge decreases with equal acceleration. Turbulence and rapid change characterize this era and the challenge to nation building is in equipping a highly educated, self-motivated, capable and innovative workforce, in order to cope with the generation and application of new knowledge.

In this knowledge-intensive era, career mobility is different than in the past (Brown, 2000) as individuals often travel multiple career paths. Workers also cannot afford to keep the same skills to last a permanent single job because employers are constantly on the search for quality workers. According to Chuang (2010), reporting on a poll of 1000 multi-national corporations in Asia (including Malaysia), Asia's tight labour market is seeing employers in the region aggressively and selectively recruiting for quality candidates. The turnover rate of 12.2 per cent in Malaysia (Chuang, 2010) is also manifested in workers having a field day hopping from job to job seeking better pay and opportunities. High

employee turnover is characterizing the Asian jobmarket, thus continued professional development is essential for job security. The implication for workers is for them to engage in re-skilling throughout their working lifespan.

The concept of continuous development to stay viable in the workforce should be inculcated at the pre-employment stage; most significantly in tertiary education. The norm of majoring in a single subject and specializing in acquiring the skills and knowledge for work in a specific field of practice, as is common in Malaysian universities, cannot be viewed as the culmination of all learning in life. Given the exponential growth of information, learning self-directedly beyond the formal schooling years is requisite.

Furthermore, university graduates should be educated to stay competitive and continue learning 21st new skills and literacies to enable them to stay abreast with survival skills needed in any working environment. Among some important 21st century skills are information and communication skill, thinking and problem solving skills, interpersonal and self-directional skills. The Qualifications Agency in Malaysian Ministry of Higher Education (http://www.mqa.gov.my/en/utama_sjk.cfm) stipulates that students, at the end of a period of study, should be able to achieve the following learning outcomes in eight domains: knowledge, practical skills, social skills and responsibilities, communication, leadership and team skills, problem solving and scientific skill, information management and lifelong learning skill and managerial and entrepreneurial skills. On top of that, learners in this technological age need digital literacy in research skills to navigate large quantities of information from printed to digital sources.

The self-directed learning processes of determining tasks and goals, solving problems, deciding upon steps and alternatives, finding resources, maintaining attention towards immediate tasks and fine-tuning the learning process (Brockett & Hiemstra, 1991; Garrison, 1997; Knowles, 1975) are pertinent to the ultimate development of self-directed individuals who treasure, and possess the ability to learn continuous on their own initiatives. Learning, in this standpoint, becomes a lifespan development and a part of daily pursuits (Lave & Wenger, 1991; Kasworm, 1983).

Statement of Problem

Research findings indicate a minimum of 10 years to achieve expert status in any discipline (Feltovich et al., 2006). This implies that the goal of producing graduates who have the ability, learning strategies and mental habits to deepen their expertise, self-directedly, throughout their career after graduation is relevant. The contention is that expertise is *"not a simple matter of fact or skill acquisition".* It is *"a complex construct of adaptations of mind and body, a long-term developmental process, resulting from rich instrumental experiences in the world and extensive practice. These cannot simply be handed to someone"* (Feltovich et al., 2006:57).

Specifically in the field of instructional design, instructional designers need to hone their expertise through solving ill-defined problems (Ertmer & Stepich, 2005), in which instructional designers figure out solutions for everyday life contexts, where situation may not be well specified, goals are unclear and having insufficient initial information embedded in the larger system of the project (Ge & Land, 2004). In this case, the learner has to have self-determined goals and self-monitoring strategies to advance their expertise

and instructors have to develop new pedagogies to accelerate the process of achieving expertise in a field.

Unfortunately, metacognitive skills requisite to self-directed learning such as assessing demands of the tasks, evaluating own knowledge and skills, planning learning approach, monitoring progress and adjusting learning strategies, *"tend to fall outside the content area of most courses, and consequently they are often neglected in instruction"* (Ambrose *et. al.,* 2010:191). Furthermore, prevalent teacher-directed learning processes in learning institutions inhibits valuable opportunities to develop self-directed learning skills such as goal setting, metacognition, mistake detection, preflection (choosing appropriate tasks for learning) and reflection (van Merrienboer & Sluijsmans, 2009; van Merrienboer & Kirschner, 2007) and perpetuates the failure-to-learn-in-school scenario.

Status reports of teaching and learning in Malaysian universities convey that our students are over-dependent on spoonfed curricula; which is manifested in the lack of active participation and overall academic endeavour during tutorials (Pandian and Aniswal, 2005). Rote learning and the culture of plagiarism are rife in the campus due to the exam-oriented approach and teacher-centred approach used (Thang, 2003). According to Daing Zaidah Ibrahim et al. (2001), there are inherent expectations that students are passive players while instructors are active players, resulting in some reluctance and resistance among learners to take control of own learning.

This phenomenon in our higher education classroom does not duly reflect the socio-cultural development of our digital society. In order to help our students help themselves and adapt to the changing landscape of career requirements in the 21st century, self-

directed and social forms of learning, being the capstones of continuous lifelong learning (Raidal & Volet, 2009) and prerequisite to successful online learning (Shapley, 2000), ought to be inculcated. Students need well-defined guidance, in this case, it is suggested in instructional design, to help them face the challenges of learning self-directedly in an age of information overload; to make sense in difficult situations when conducting self-directed learning or research.

Purpose and Significance of the Study

In view of the aforementioned global and local concerns, this study aims to design an instruction that is able to develop self-directed learning among higher education adult students, and to seek and identify the instructional activities and conditions which facilitate successful self-directed learning in a blended learning environment. Thereby, fulfilling the significance of the study to inform policy makers, researchers, university instructors and improve future decision making process for the development of learner-centred and self-directed instruction. This study also aims to provide a methodological direction for the development of self-directed instructional design in developing the instructional design and development knowledge base (Richey & Klein, 2007). Specific research objectives to achieve overall research goals are used to formulate the three research questions (Table 1.1).

Table 1.1 Mapping research objectives to research questions

Objective	Research Question
To examine structural tensions as agents of development within the context of the activity system (refer to Theoretical and Conceptual Framework); which contributes to behaviours of resistance or acceptance towards the designed learning environment - eSCLE.	i) How does the designed activity system facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?
To identify the potential functions of the web-based technologies utilized in the study; which facilitates the development of SDL within the activity system of eSCLE.	ii) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?
To examine the transformation process of self-directed learning within the eSCLE.	iii) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

Research Questions

The research objectives and corresponding research questions (Table 1.1, frame and guide the research, in an attempt to gain more understanding into the role of social collaboration in developing SDL as in how adults engage in self-directed learning using social networks and peer support groups for emotional sustenance and educational guidance (Brookfield, 1995), to investigate into the specific role of web tools for its mediating capacity in supporting students' self-directed learning through social participation, and to find out the developmental phases of SDL within the designed activity contexts. The research questions are:

i) How does the designed activity system facilitate the development of self-directed learning in an e- socioconstructivist learning environment (eSCLE)?

ii) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

iii) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

Limitations and Delimitations

This study is an instructional research project within a localized teaching and learning situation which is bound by organizational policies. Since this is not a whole-scale implementation at the institutional level, findings cannot be generalized to all higher institutions in and out of Malaysia, without respective needs analysis conducted.

The focus of the study is on adult learners in a higher education setting. Compared to children and teens, adult learners have accumulated a certain amount of life and work experiences that gives them a different education outlook and of which should be exploited as learning resources in teaching and learning. Learners from other age-groups and in other learning settings may embrace self-directed learning differently.

Self-directed learning is studied as a process through developmental stages in this research. Learners develop self-directed learning skills at individual pace. Also due to the developmental notion of self-directed learning, although the instructional design originates from the classroom context, there is no restriction of studying self-directed learning within formal instruction. Instead, the role of web tools is explored as a tool to facilitate self-directed learning across contexts of formality. Thus, there is no compartmentalization of the origins of cultivated self-directed learning in terms of inside or out of classroom.

The study is also carried out within cost, time and technology constraint to accommodate organization's boundaries and limitations, participants' degree of involvement and the researcher's finite resources, both tangible and intangible. Hence, the impact of this study may be limited to the described contexts, as deemed by other practitioners or researchers.

Operational Definitions

The term *instructor* or *facilitator* is used to refer to the teacher role and in implying the student-centred view of learning in the instructional context.

An *adult learner* is identified by two criteria: an individual who performs roles associated by our culture with adults (worker, spouse, parent, soldier, responsible citizen) and an individual who perceives himself or herself to be responsible for his or her own life (Wlodkowski, 1993:5).

Self-Directed Learning involves learner independent learning, through a process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify human and material resources for learning, select and implement strategies, and evaluate learning outcomes (Knowles, 1975; Merriam & Caffarella, 1999). It is related to self-regulated learning (SRL) when involving metacognitive awareness of active engagement and goal-directed behaviour; thus SDL encompasses SRL (Loyens, Magda and Rikers, 2008). This study operationalizes self-directed learning as a trait that is to be developed through progressive stages of growth.

An *e-Socioconstructivist learning environment* is a learner-centred environment that incorporates the design of a physical and virtual learning space (also known as a blended learning environment) conducive for constructing knowledge and building upon existing knowledge in collaboration with others. The term ‘socioconstructivism’ fall within the broad domain of the ‘sociocultural’ approach, referring to the social nature of learning within culture and community; specifically where activities of the learning community, framed by its culture, cohere in a way that is accessible to members who function within

the social framework. The *'e'* in e-socioconstructivist learning environment relates to electronic or technology-integrated learning; where in this study refers to web-based technology.

The designed *activity system* is a collective community of multiple points of view; where unit of analysis is not based upon individual self-directed learning activity but division of labour, as schematized in activity theory (Engeström, 1999).

The concept of *instructional design (ID)* is focused upon decisions of 'how to teach' as compared to 'what to teach' (Reigeluth, 1999). In completing ID tasks, learners analyse learning and performance problems; including the design, development, implementation, evaluation and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings (Reiser, 2001). In all aspects, ID is learning and learner centred.

Web-based Technologies in this study more appropriately refers to open source or social software that enables greater social and participatory use.

Theoretical and Conceptual Framework

In this study, learning is perceived as 'activity' because constructivist learning environments are activity-oriented (Jonassen, 2002). Activity theory, in view of its consonance with constructivist approaches (Jonassen & Land, 1999) and its prevalence in the design of human-computer interactions (Nardi, 1996) is used to help the examination of activity that involves technology as part of the larger scope of human activities. It is used as a form of sociocultural analyses, to help the understanding of how social artifacts

and social organization mediate social action within a technology- supported learning community (Bryant et al., 2005; Jonassen, 2002). Barab et al. (2004) maintain the research role of activity theory in its function as a *"lens"* in characterizing the participatory unit; hence in this study, self-directed learning is studied within the context of the eSCLE as a *human-in-action* and collective activity system, incorporating a collection of people and the tools in use in learning environment, and not based on the primary unit of analysis of discrete individual actions (Greeno, 2006; Leont'ev, 1972).

Based on the premise that *"conscious learning emerges from activity (performance), not as a precursor to it"*(Jonassen, 2002: 62), activity theory is used to help define the *consciousness* of self-directed motives, goals and conditions through corresponding activity, action and operation (Figure 1.1). In socio-constructivist manner, this involves the conscious process of meaning making emerging from activity and personal reflection on activity (Jonassen & Rohrer-Murphy, 1999). Self-directed learning, is thus examined as an external and internal concept (Refer to Chapter Two; The Evolution of SDL) as a dialectical process, *"where consciousness, learning and development simultaneously shape, and are shaped by technology"* (Gay, Rieger & Bennington, 2001:509).

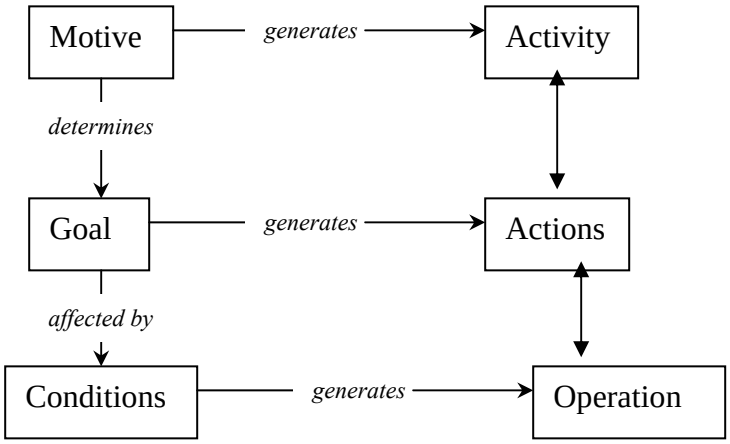


Figure 1.1 Processes in the Activity System (Leont'ev, 1972)

The interaction between human beings and their learning is what that contributes to the existence and development of human mind, through the understanding of activity, action and operation in Leont'ev's (1972) model of activity (Figure 1.1). The activity system is bounded and consists of object-oriented activities, goal-directed actions and activity conditions. The objects of the activity system, being transformable (Nardi, 1996), characterize the dynamic relationship among activities, actions and operations; whereby the activity is made up of goal-directed actions towards accomplishing the object, the actions are a series of operations (which is defined by its automaticity and unconscious effort to perform through practice). Due to this hierarchical and reverse dynamics (indicated by bi-directional arrows in Figure 1.1) of activities, actions and operations in an activity system, this study employs the idea of facilitating self-directed learning as a continuous developmental process. This is based upon the concept that practice and internalization propels activities into actions and eventually into automatized operations; at the same time recognizing that operations could also be *"disrupted"* back into actions (Jonassen & Rohrer-Murphy, 1999:63).

Given that educational findings from global research provide evidences that work in varied policy, cultural, institutional or language contexts, this study examines the issues identified by the research's aim and context with consideration of the social norms of a localized activity system. In order to understand the process of developing self-directed learners in an eSCLE in an all-encompassing manner, a multi-prong strategy is utilized to examine motive-driven activities, goal-driven actions and conditions-driven operations. (Figure 1.1) and elaborated below:

- At the outset, the motives of designing for instruction to develop self-directed learning are made clear, so that it can drive the motivation for instructional design in a theoretical appropriate manner. This involves questioning ‘why should I design instruction in this manner’ before proceeding to activity implementation.

- The next stage involves inquiring ‘what’ actions self-directed learners undertake and how they could be facilitated. This is to facilitate the implementation of activities where learners could engage in appropriate actions towards specific goals determined by both instructor and self.

- Further on is the concern into designing for conditions of learning that facilitates the transformation of conscious self-directed actions into automated self-directed learning in various learning situations. The goal of operationalizing self-directed learning frames ‘how’ the eSCLE should be developed. Investigating learning through sociocultural activity theory lenses helps the understanding of various dimensions of self-directed learning processes in technology-integrated learning environment.

Borrowing the idea of *mediation* in activity theory, self-directed learning experience is *“shaped by the tools and sign systems”* used. (Nardi, 1996). The mediating tool within the activity system refers to the computer-supported collaborative learning potential of web-based technology which helps transform the learning environment into a socio-cultural learning web suitable for the support of the outcome of self-directed learning.

In designing for social constructivist activities in the technology integrated environment eSCLE, the focus is not simply to support human–computer interactions but human–human and human problem-domain interactions that transact with technology, where mediating activities are conducted in the personal, interpersonal and community/institutional planes (Rogoff, 1995). This dimension of learner interaction is designed to support self-directed learning through a mediated activity system of object-oriented activities (comprising of experiences, knowledge) and physical products and tools (both abstract and physical).

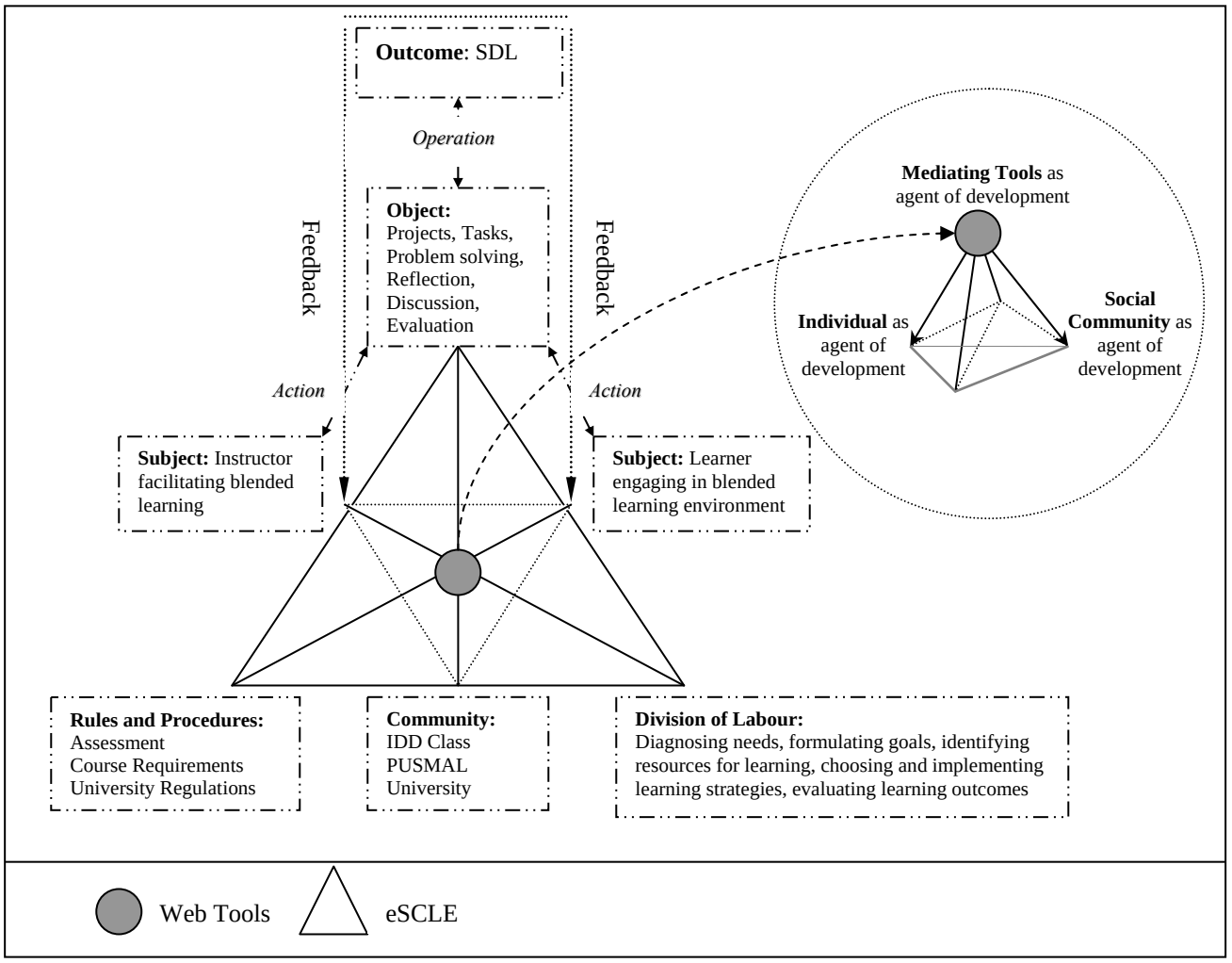


Fig 1.2 Designing for Self-Directed Learning in an e-Socioconstructivist Learning Environment

The development of the eSCLE is an adaptation of the activity theory (Engeström, 1999). It is designed to facilitate self-directed learning in a mediated activity system; within the social, cultural and technical aspects of human actions (Figure 1.2), which highlight the significance of learning environment and participation in contextualized activities. The eight components of the activity system consisting of activity, object(ive), subjects, tools, rules and regulations, division of labor, community and outcome are translated into the context of this study through guiding questions (Appendix 1). As conceptualized in Figure 1.2, both subjects (instructor and learner) are committed to actions (involved in doing) directed to the objects of projects, tasks, problem solving, reflection, discussion and evaluation within the community of the Instructional Design and Development(IDD) class and the client of the ID project.

The conceptual framework recognizes a wide range of factors within the localized instructional activity system that could impact the achievement of an objective or outcome. Rules that are imposed by the instructional / social community may affect designed activity. Therefore, the subjects provide feedback for each other in an effort to share the responsibility of facilitating and engaging self-directed learning through goal directed actions. Furthermore, contradictions or tensions within activity systems need to be analyzed appropriately for its role as the agents of change and development (Engeström, 1999). In this case, tensions subjects face as old elements (eg: traditional pedagogies and familiar technologies) interact with new mediating tools and objects (Figure 1.2) is examined as an initial attempt to improve teaching and learning towards self-directed and lifelong learning.

Conclusion

This chapter has laid the foundations for the thesis by introducing the research problem, research objectives and research questions upon the backdrop of global and local developmental scenarios and the needs of higher education institutions. Establishing the parameters of the research through set limitations, delimitations and operational definitions, a conceptual framework based on activity theory is developed to give coherence and direction to the empirical inquiry to be implemented and also to operationalize theories on which the study is based. These theories would be explored in the next chapter.

CHAPTER 2

LITERATURE REVIEW

This chapter supports the theoretical framework of the study by discussing related theoretical concepts, contemporary and past research contexts that have a bearing on the design of this study and the interpretation of its results. A review of the empirical and theoretical literature is conducted. Empirical reviews are limited by interventions that yield prescriptive principles in instructional situations or those that reported changes in self-directed learning; while theoretical reviews are limited by concepts pertinent to the operational definitions outlined in Chapter 1.

Introduction

The purpose of this study is to employ developmental research strategies to design an e-socialconstructivist learning environment (eSCLE) for facilitating self-directed learning so that the following research questions could be addressed:

i) How does the designed activity system facilitate the development of self-directed learning in an e- socioconstructivist learning environment (eSCLE)?

ii) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

iii) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

As instructional design and development must be based upon some theory of learning and/or cognition (Bednar et al., 1992), the literature forming the theoretical basis underlying the design such as the unique characteristics of adult learning and student-centred learning, the field of instructional design and the training of instructional designers, the evolution and concepts of self-directed learning, self-directed learning in the instructional context, web tools in 21st century learning and an e-social constructivist learning environment for self-directed learning will be sought out. The consistencies and controversies revealed in these areas of literature review inform the design and development of an eSCLE for self-directed learning.

Designing Instruction for Adult Learners

Researches in the fields of cognitive sciences, learning sciences and learning psychology have yielded principles on how the adult mind works in learning. It is established that adult learners learn differently from children; they have a vast reservoir of experience, increasing executive control, and the desire to be self-directing, (Knowles, Kuhn & Pease, 2006, Knowles, 1980).

Adult learners are generally more independent, preferring practical, applicable, relevant, goal-directed learning. They usually have a pre-determined motive or purpose when enrolling in higher education, therefore desire learning results that are of immediate personal benefit. In adulthood, individuals tend to learn differently, moving from subject-centredness to performance-centredness (Knowles, 1990; Knowles, 1988). Therefore, in teaching adult learners, it is important to distinguish their unique attributes in order to incorporate the principles of adult learning in the design of instruction.

Adult learning emphasizes on processes (eg: Brookfield, 1995; Thompson, 1999) manifested by its four major research areas in i) self-directed learning where adults take control of their learning, ii) critical reflection in which adults think contextually and critically, iii) experiential learning where experiences provide rich and valuable resources in different learner and iv) learning to learn which helps adults become skilled at learning continuously or lifelong learning. In the field of training, it is projected that adults learn best when they are involved in a five-step process: experiencing, publishing, processing, generalizing and applying. First, they *experience* learning by activating schemata based on past experience, through reading up and then by experiencing new subjects**.** Then, they *publish* their learning by narrating the experience; both old and new. Next, they *process* the information learnt when they think, discuss and evaluate what they have done, read or watched. *Generalizing* learning happens when they relate in writing or speech how what is learnt could be applied to their own situation. Finally learning is *applied* to the planning and implementing of the actual task (Thompson, 1999).

A curriculum that is responsive to self-directing adult learners must be able to motivate them to learn by empowering them to participate as an active learner, using their experiences and reflection to solve problems that could be applied in real life. Lately, Knowles' (1988, 1990) initial propositions of adult learning, known as andragogy, has been drawing flak for the over-emphasis on the individual learner while neglecting the sociohistorical and cultural contexts of learning (Alfred, 2002; Merriam & Caffarella, 1999). Friere (2000), exemplifying constructivist thinking, maintains that adults are capable of transforming socio-cultural realities which shape their lives through deepening their awareness and acting upon it. He strongly believes in the power of the learner; advocating collaborative learning among learners with common needs as this significantly

increases potential for learning, encouraging different viewpoints, leading to transformation. Researchers in this school of thought (Friere, 2000; Merriam & Caffarella, 1999) suggest research of adult learning to examine into the learning contexts and its sociocultural factors in adult online learning environments, which is applied in this study.

The Evolution of Self-Directed Learning

The concept of self-directed learning originates from humanistic researchers such as Rogers (1961) and Maslow (1970); and could even be traced to John Dewey (1916), who defined education as the agency that facilitates the unlimited potential for growth and development that each individual is born with, hence forewarning teachers not to control or interfere with learners' learning process. The enduring influence of Dewey is evident in higher education, where emphasis on contemporary learner-centred approaches in the higher institutions of learning shares common goals to develop student responsibility and autonomy in learning towards sustainable lifelong learning skills.

So far, the concept of self-directed learning has been primarily explored from at least four perspectives: the *process* in which an individual takes initiative to plan, carry out and evaluate their own learning (Merriam & Caffarella, 1999; Mocker & Spear, 1982; Knowles, 1975); a *personal attribute,* involving the psychological awareness and readiness to manage and regulate their own learning (Garrison, 1997; Guglielmino, 1978); an *attitudinal* approach in opening up to learning (Grieve, 2003) and the *learning context* where learning takes place (Candy, 1991), which includes the social contexts of institution and policies (Brockett & Hiemstra, 1991).

The most established definition of self-directed learning, used to form the basis of many others is developed from Knowles (1975:18) original concept as *"a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes*". The five key features of self-directed learning relates to holding learners responsible for identifying their own learning needs, determining their learning objectives, deciding how to evaluating learning outcomes, identifying and pursuing learning resources and strategies and evaluating the end product of learning; in essence learner responsibility in planning, implementing and evaluating their own work (Iwasiw, 1987). The integration of self-management (management of the context, including social setting, resources and actions) with self-monitoring (monitoring, evaluating and regulation cognitive learning strategies) in self-directed learning (Garrison, 1997) extends the *preparatory* (eg: goal setting) and *executive* (eg: selecting information or resources) functions, to encompass the *closing* functions of future use and transfer situations (Simons, 2000). Self-directed learning is thus a continuous engagement in acquiring, applying and creating knowledge and skills in the context of an individual learner's unique problems (Fischer & Scharff, 1998) in both formal and non-formal learning situations. These processes and conditions of self-directed learning concord with the principles of adult learning, being one of the pillars in developing adult learning (Merriam, 2001) and one of the predominant subjects in education research over the past decade, especially in the field of adult education (Grieve, 2003; Brockett & Hiemstra, 1991).

It used to be that self-directed learning is considered an individual facet of the learner rather than oriented toward community learning experiences (Long, 2000). However, in the

90's, there is increased attention to include the *"cultural formation of the self"* to avoid the development of obsessive self-directed individuals that are *"self-contained, volitional beings scurrying around engaged in individual projects…work(ing) against cooperative and collective impulses"* (Brookfields, 1995). Studies that focused on the processes of "self-instruction" (Oddi, 1985) or "autonomy" (Chene, 1983) brought on criticisms to Knowles' definition of self-directed learning; as placing insufficient emphasis on developing critical awareness and encouraging social action (Hammond & Collins, 1991). Perhaps, it is more apt to develop self-directed learners to be collaborative, participative yet independent as indicated by some researches (Fitzgerald, 2003; Candy, 1991).

Additionally, conditions of self-directed learning should adapt to suit philosophical and methodological shifts affecting instruction where self-directed learning researches in the 21st century encompass challenges of designing for self-directed learning in online and constructivist learning environments (Huang, 2002; Simons, 2000; Tam, 2000). Presently, in view of our digitalized knowledge-based society, the abilities of learners to self-direct their own learning in online learning environments are of interest to researchers (Hartley & Bendixen, 2001).

Due to the need for an expanded scope of research to include both individual and social dynamics of self-directed learning (Brockett, 2009) and the lack of self-directed learning research in specific contexts of higher education (Merriam & Caffarella, 1999), this study attempts to close the gap by exploring the design and development of web-technology integrated self-directed learning among adult learners enrolled in a higher institution of learning; thus addressing a major focus in the self-directed learning literature on fostering students' self-directed learning skills, increasing their capacity to conduct their own

learning, within formal educational environments (Merriam, Caffarella & Baumgartner, 2007). A different approach, other than more heavily relied quantitative methods and anlaysis in self-directed learning research (as reported in Davis et.al.,2010), is employed in this study. The design and development approach with a leaning towards a qualitative approach allow researchers to increase the scope of their understanding of self-directed learning by examining participants' personal experiences and how those experiences have led to their development of self-direction.

Self-Directed Learning in the Instructional Context

U.S. educational institutions have been challenged to develop new and innovative pedagogies to support previously neglected skills such as those needed for independent learning (The Secretary of Education's Commission on the Future of Higher Education, 2006). Teachers are encouraged to foster self-directed learning skills by offering students the opportunity to take responsibility for personal learning, conduct self-assessments, and participate in the design of learning environments (Bransford & Donovan, 2005). Similarly, institutions and governing bodies outside of the United States have long emphasized the importance of self-directed learning and lifelong learning for education. Notable initiatives and self-directed learning related activities have been implemented in European countries such as Belgium, France, Italy, Greece, Switzerland, The Netherlands, and the United Kingdom with national reports focused on self-directed learning from many of these countries (Straka, 1997). Additional self-directed learning-focused reports of research and advocacy have come from areas as diverse as Asia (Chu & Tsai, 2009; Mok, Cheng, Leung, Shan, Moore, & Kennedy, 2007), Australia (Candy, 2004), and South Africa (Lindh & Hugo, 2005). It is clear that many

countries around the world believe that fostering self-directed learning skills is vital in our global economy.

Self-directed learning, just like learner autonomy, is a behavioral construct, and could be developed with the right intervention and facilitation (Confessore & Park, 2004; Grow, 1991). Self-directed learning is a journey of growth in cognitive and ethical development towards greater independence (Perry, 1981) through progressional and transitional stages of increasing self-direction (Grow, 1991). Most teaching and learning methods adopted in formal education for fostering self-directed learning skills are focused on increasing the capacity of students to direct their own learning processes through practice doing so (Merriam et al., 2007). Most studies agree that instructors play a significant role in increasing learner self-direction; the manner of guidance is a contention. Grow (1991), proposing his 'Staged Self-Directed Learning Model' (SSDL) proposes instructors to guide learners through the four stages of self-direction (Table 2.1) according to their readiness and comfort with self-directed learning while matching the learners' stage of self-direction with appropriate instructional strategies as problems arise when the teaching style is not matched to the learner's degree of self-direction. Bolhuis and Voeten (2001) also propose a diminishing teacher control model where the teaching process transition from modeling, to activating the students to participate, and ultimately having them practice and present on their own. Such approaches are argued by Kirschner, Sweller and Clark (2006) as insufficient to develop self-directed learning skills. According to them, simply reducing the amount of support and guidance may impinge upon the acquisition of knowledge in long term memory.

Table 2.1 Grow's (1991) Staged Self-Directed Learning Model (SSDL)

Stage	Student	Teacher	Examples
Stage 1	Dependent	Authority Coach	Coaching with immediate feedback. Drill. Informational lecture. Overcoming deficiencies and resistance.
Stage 2	Interested	Motivator Guide	Inspiring lecture plus guided discussion. Goal-setting and learning strategies.
Stage 3	Involved	Facilitator	Discussion facilitated by teacher who participates as equal. Seminar. Group projects.
Stage 4	Self-Directed	Consultant Delegator	Internship, dissertation, individual work or self-directed study group.

Clearly, both viewpoints have their limitations. In the SSDL method, practitioners could query how learner's developing stage of self direction could be determined. The model may be deficient in 21st century learning as it has not included learner's view of how they should carry out self-directed learning and it presumes ability of teacher to adapt teaching style to suit situation. Similarly, Kirscher et. al.'s (1996) argument may be relevant in the pedagogical approach where the teacher-led paradigm leads the "content model", but this study, being in the realm of self-directed learning in higher education for 21st century learners, is more concerned about the construction rather than merely the acquisition of knowledge. Furthermore, in developing self-directed learners, process is more important than product alone; as a process-oriented approach to teaching and learning *"facilitates*

independent learning, supporting students to become proficient learners in the field concerned and preparing them for life-long learning". (Bolhuis & Voeten, 2001:838).

The dispute regarding the development of self-directed learning in instructional contexts calls for answers to the questions of "how the development of self-directed learning is affected by instructional methods" and "to what extent it is a matter of instructional design".

Notably, education in the 21st century would benefit from instructional approaches that are appropriate to its learners and learning environment. Heutagogy, an approach proposed by Hase and Kenyon (2000) to address the deficiencies of pedagogical and andrologogical approach, is said to be appropriate to the needs of 21st century learners. Heutagogy refers to self-determined learning with the goal of developing individual capability, drawing together some ideas from the past such as action learning, capability, work-based learning, double loop and organizational learning. In this paradigm, learning experience extends the simple acquisition of knowledge and skills to the fundamental 21st century skills of knowing how to learn and learning how to learn.

A self-directed classroom learning environment ought to see reformation from teacher-student role, learning content, curriculum, social characteristics, role of technology and assessment (Eberie & Childress, 2007). In order to promote this self-directed learning ambience, there is the need to view the design of learning environments from the perspective of the learner; that is to design a learner-centred rather than a teacher-centred learning environment (Bray & McClaskey, 2012; Jonassen, Cernusca & Ionas, 2007).

Instructional strategies for Self-Directed Learning

The pertinent question is "If adult learners are willing and able to be self-directing in learning, how could the educational institution support learners to exercise their autonomy?" (Moore, 2006). In the medical field, learner centred approaches such as self-directed learning is implemented as an educational strategy to produce doctors for lifelong learning (Spencer & Jordan, 1999). This approach should be employed by educationists who are resolute to develop self-directed lifelong learners.

Instructional strategies that could be implemented to develop, enhance and retain self-directed learning include problem-based learning, task-based learning, experiential and reflective learning, portfolio based learning, small group, self instructional and project based learning, peer evaluation and learning contracts (Spencer & Jordan, 1999). These strategies promote deep learning and learning based on experience to facilitate the integration of new knowledge and understanding into both personal and professional contexts.

Problem-based learning (PBL) is an instructional approach that motivates adults to learn (Knowles, 1998) as they *"identify issues raised by specific problems to help develop understanding about underlying concepts and principles"* (Spencer & Jordan, 1999). Contrary to traditional approaches where new knowledge is a prerequisite for problem-solving, PBL sees the assimilation of new knowledge and understanding as a process of working on the problem, hence is also interestingly known as *"problem first learning***"** (Maudsley, 1999). Understandably, this relatively new approach to learning (especially out of medical field) would experience certain implementation complications such as increased

stress on students and staff (Berkson, 1993: Marchais, 1993), implementation difficulties in large classes or in situations where enthusiasm is lacking (Albanese & Mitchell, 1993).

Nonetheless, experimental research conducted in the postgraduate setting reveal that residents exposed to a problem-based learning (PBL) curriculum engaged in significantly higher levels of self-directed learning behaviours; such as increased time spent on independent study, academic discussions, computer literature searches, than their counterparts (Ozuah, Curtis & Stein, 2006). This finding substantiates the problem-solving nature of PBL in increasing motivation of members to engage in independent reading and research.

In higher education, there ought to be dedicated emphasis on the development of personal skills and abilities which are competences-in-demand, in industry and society. As established, these are requisite skills for self-directed lifelong learning. Moesby (2005) asserts that if institutions are determined to develop students with personal competences, then these areas need the same focused awareness as traditional academic and professional competences. His experience in training and researching for PoPBL as an educational model in higher education provides some evidence regarding the success of a project-oriented problem-based learning approach (PoPBL) in developing students' personal skills and abilities in tandem with students' technical or professional competences (Moesby, 2005). In his study, he compared the effects of an institution practicing PoPBL and a conventional taught institution in Denmark, concluding that the PoPBL curriculum is superior in developing personal competences, while both institution shares the same credit for professional competences. The PoPBL implementation plan encompasses nine semesters of university education; showing that teachers can engage both personal

competences and technical, professional competences within planned project work, and with varying emphasis throughout the semesters. Such implementation is an example of a long term PoPBL plan, which involves semester or year projects; whereby it is possible to carry out short-term and medium-term options of project-oriented learning, according to learning situations, where students collect data or other information for the "next lesson" and where small projects are given as part of other activities (Proulx, 2004).

Taking the cue from the task-based approach in language teaching, activities should similarly form the core of a self-directed learning curriculum. Students ought to engage in multiple forms of self-directed learning activities such as reading, informal discussions, independent study, self-instruction packages, guided study, group work, learning contracts, computer-assisted learning, distance education and teleconferencing (Iwasiw, 1987, Hamilton & Gregor, 1986) where there is active participation on the part of the learners. Task-based learning could lay the foundation for an active learning curriculum, where learners practice "reactive" autonomy rather than "proactive" autonomy (Littlewood, 1999). When learning is primarily focused on activities and involves learning through doing meaningful tasks (Skehan, 1996), students are empowered to *"transform themselves from objects to subjects, from passive to active"* thence on better able to resist the manipulation and domination of others' views (Kellner, 2000).

Self Development within Socio-constructivist Theory

The concern of 'others' in the society is important in the development of a self-directed individual. Foundational thinkers in the field of constructivism such as Dewey (1916), Vygotsky (1978) and Bruner (1996), view knowledge as a shared entity with understanding constructed by individual learners through social interaction with others.

Development of an individual (through learning) is not just driven by internal processes but in combination with active adaptation to the social world. Vygotsky, in his original study, saw a constructive role for adults in fostering child development, by extending the child's zone of proximal development (ZPD). The ZPD theory describes the distance between what an individual learner can do alone and what can be accomplished in collaboration with more capable others. Translated to a present day social constructivist learning environment, the scaffolding from ZPD could be provided by more able peers, discerning tutors or resources in a well-designed task or learning environment. The development of an individual requires authentic educational activities as an opportunity for "emergent interaction" in socially situated learning. It is upon this basis that this study situates self-directed learning as co-regulated individual development.

The acknowledgement of the intertwined nature of social and individual aspects of development is shared by sociocultural theorists who agree that firstly, effective learning is situated, occuring via interaction with and support from people and physical artifacts through a process of "legitimate peripheral participation" (Lave & Wenger, 1991). This contemporary idea of apprenticeship promotes the idea of a learner's socio-cultural transformation through engaged participation in communities of practice, notwithstanding natural conflicts in social practice (Lave & Wenger, 1991). According to this school of thought, learning does not need to be intentional; unintentional learning situated within authentic activity, context and culture could help a novice move from the periphery of the field to the centre where active engagement within the activity, context and culture of the "community of practice" enables the learner to advance in expertise with community support and guidance. The acceleration of expertise (discussed as a statement of problem in Chapter 1) brings an implication for this study concerning the significance of designing

teaching and learning situated in authentic and meaningful contexts to help foster the development of self-directed learning applicable to the socio-cultural situations in the real world situation. Secondly, knowledge generated through a dialogue of negotiation is distributed among members of the subject group and community in the activity system as distributed cognition (Jonassen, 2002). In this "distributory" learning process, new mental functions and patterns of thoughts are socially negotiated and evaluated for *"viability of individual understanding"* (Duffy & Savery, 1995), this with mediational assistance from physical, mental or technology artifacts. Therefore, the learning environment (context and setting) and its *"social dialogical process"* (Duffy & Savery, 1995) where thinking and learning occurs will be examined.

The teacher in the context of instruction can play a special role to intervene to the extent of motivating self-efficacy and self-direction. The quality of teacher intervention is recognized as "scaffolding", which should not be confused with mere 'helping' (Mercer, 1994). Scaffolded instruction means that the learner is enabled to complete tasks independently after having help given in tasks that could not do unassisted; the learner also proceeds to a greater level of self-directedness as a result of successfully completing the task with the outside assistance (Mercer, 1994). The goal of scaffolding is to *"awaken and rouse to life an entire set of functions which are in the stage of maturation, which lie in the zone of proximal development"* (Vygotsky, 1978 cited in Mercer, 1994: 103). The empowering nature of scaffolding can be seen in terms of developing self-directed learning. In this study, scaffolding is used only when needed to extend the learner's knowledge, task management and as a support tool to set learners free to construct their own learning (Schunk, 2004).

A rich social context creates a stimulus for learning, interplaying with individual learners' existing knowledge and problem to be solved (Tam, 2000). Interacting with physical and social artifacts, learners discover themselves and their own learning by reflecting on current or past experiences. The processes of discovery learning (Bruner, 1996) where learners actively participate in exploring concepts, relating ideas and finding alternative solutions to problems allows ways of understanding to emerge and evolve through negotiated meanings (Hannafin et.al., 1997). This combination of socio-cognitive and socio-cultural constructivism underpins the theoretical basis of this study's design; where self-directed learning sees learners *individually* investigating, discovering and constructing new meanings while *collaboratively* exchanging and exploring ideas together.

Socio-constructivism and the Teaching of Instructional Design (ID)

Critics harbouring postmodern perspectives about constructivist models of teaching claim that the model generates knowledge slowly, is time consuming and inefficient; hence not all teaching methodologies can rely on constructivist principles (Roblyer, 2006). While recognizing the likelihood of cognitive load in highly complex environments (van Merrienboer & Sluijsmans, 2009), the constructivist approach of authentically-based experiences and rich learning tasks are able to stimulate the integration of knowledge, skills and attitudes within the challenging contexts of real-world instructional design situations, thus helping the construction of a deep and flexible knowledge base, that facilitates problem solving and transfer in unfamiliar situations (van Merrienboer & Sluijsmans, 2009; Grabinger, Aplin & Ponnappa-Brenner, 2007). To be cautioned, nonetheless, is the detrimental effect cognitive load may pose to novice learners, who lack

proper schemas to integrate new information with their prior knowledge (Kirschner, Sweller & Clark, 2005).

Instructional design is a field of *"a highly complex, applied, team-based discipline"* (Bannan-Ritland, 2001), involving not just theoretical aspects but practical competency skills while requiring creative application of principles of learning, planning, decision-making and technological expertise. Recognizing these, theorists and practitioners responsible for teaching instructional design are shunning traditional methods of *"hierarchical, top-down methods of problem decomposition"* (Tripp, 1991:2), calling for more authentically based teaching approaches to prepare instructional designers for the complex and dynamic forces of field practice (Bannan-Ritland, 2001; Ertmer, 1995). This is because implementing a traditional instructional design such as the objective-rational model would remove novice instructional designers from *"the exigencies and specificities of real world practice"* (Bannan-Ritland, 2001) characterized in the constructivist-interpretivist ID model (Table 2.2).

Table 2.2 Comparing the behaviorist and constructivist ID Model

	Behaviorist ID Model (Objective-Rational)	Constructivist ID Model (Constructivist-Interpretivist)
Process	Sequential and linear	Recursive, nonlinear and sometimes chaotic
Planning	Top-down and systematic	Organic, developmental, reflective and collaborative
Objectives	Predetermined and used to guide development	Emerge from design and development work
Expertise	Critical to ID work	General ID experts do not exist

Procedures	Careful sequencing and teaching of sub-skills emphasized	Learning in meaningful contexts emphasized
Goal	Delivery of pre-selected knowledge	Personal understanding within meaningful contexts
Evaluation	Summative evaluation critical	Formative evaluation critical
Data	Objective data critical	Subjective data may be the most valuable

(Summarized from Willis, 1995)

Recent constructivist approaches in teaching ID such as authentic ID projects (Quinn, 1994); apprenticeship model (Ertmer, 1995); contextual ID model (Tessmer & Wedman, 1995); web-based case studies (Kinzie, 1997); action learning approach (2001); focuses on learning internal events more than content (Richey, 2000). In the past, content and prerequisites were traditional designers' focal point to identify a course sequence (Gagne & Briggs, 1979). Prompted by a pluralistic view, this study encourages the development of 'constructivist instructional designers' as learners reflect on alternate perspectives situated in the culture and cognition of the environmental contexts through activity tasks. Internal learning events such as questioning, reflection, modeling, coaching, articulation, exploration constitutes the instructional designers' mental activities; in both cognition and metacognition. These mental processes, when well integrated, are fundamental in developing expertise in the field (Collins, Browns and Newman, 1989).

Socio-Constructivism and the Learning Environment

Contemporary researchers maintain that a learning environment is an approach, not an application; that which protects and celebrates identity, supports multiple levels of socializing and encourages the development of community of inquiry (Downes, 2005). This notion of learning environment lies within the social constructivist and activity theory framework of this study (refer to Chapter 1) and views significantly the context in which learning occurs and the social contexts that learners bring to their learning environment. In fact, the trend of e-learning is no longer a peripheral activity at a distance but a blended approach of making available learning resources and instructional activities to learners through online medium (Carr-Chellman & Duchastel, 2000). In other words, a well designed set of external events (i.e. a rich learning environment) where learners engage in multiple activities in pursuit of multiple learning goals, is able to facilitate, support and enhance internal learning processes to achieve desired learning outcomes.

Socio-constructivist learning environments are built upon seven primary constructivist values of collaboration, personal autonomy, generativity, reflectivity, active engagement, personal relevance and pluralism (Lebow, 1993). Examples of socio-constructivist learning environments are knowledge building communities (Scardamalia & Bereiter, 1996), communities of learning (Brown & Campione, 1994), anchored instruction (Cognition and Technology Group at Vanderbilt, 1993), problem based en case based learning (Barrows, 1985), cognitive apprenticeship (Collins, Brown & Newman, 1989).

Constructs developed in Taylor & Maor's (2000) Constructivist Online Learning Environment Survey (COLLES) provide a framework for instructors to design and evaluate for a reflective and collaborative online learning environment. The roles of

facilitators and students in the online socio-constructivist learning environment are epitomized by:

- professional relevance - the extent to which engagement in the on-line classroom environment is relevant to students' professional worldviews and related practices,
- reflective thinking - the extent to which critical reflective thinking is occurring in association with online peer discussion,
- interactivity - the extent to which communicative interactivity is occurring on-line between students and between students and tutors,
- cognitive demand - the extent to which challenges and communicative role modelling is provided by tutors,
- affective support - the extent to which sensitive and encouraging support is provided by tutors,
- interpretation of meaning; the extent to which students and tutor co-construct meaning in a congruent and connected manner.

Web Tools and the e-SocioConstructivist Learning Environment (eSCLE)

Contrary to the Web 1.0 era where technologies deliver content through drills and static webpages, the era of Web 2.0 is the era when learners use technologies *"to express and represent what they know"* (Jonassen & Carr, 2000:189). Salomon and Perkins (1996) distinguish the former as learning *from* technology from the latter as learning *with* technology. In propagating learning *with* media, web technology is acclaimed as a powerful medium, through which the ideals of social constructivism can be applied to enhance self-directed learning opportunities within a ZPD. The affordances of technology,

referring to the *"properties of that environment that enable the effectivities of the technology, the abilities of the learner to take learning actions"* (Jonassen, Hernandez-Serrano & Choi, 2000: 113), are seen as a *"powerful"* tool for *"human expression"* since Bruner (1966). One of the most salient powerful features of online learning is that it allows learning to be place and time independent (Vrasidas and McIssac, 2000). Independent of physical, geographic, institiutional and organizational boundaries (McLoughlin & Lee, 2010), online delivery media can be used to bridge instructional gaps (Huang, 2002). These features of learning are welcomed by adult learners who are more often constrained by other work, social or family commitments. Against this agenda, this study aims to examine how learning *with* technology (i.e. technology as a mediating tool) affects changes in the way knowledge is processed in self-directed learning contexts.

Based on literature, web technology helps to create a more conducive socio-constructivist learning environment, shifting the foci from knowledge-as-possession to knowledge-as-construction; from learning as outside-guided to learning as self-guided; from instruction as imparting knowledge to guidance of socially-based exploration in intellectually rich settings (Salomon, 1991). The transformative power of web 2.0 technologies to restructure hierarchies, inform and reconfigure communication, and transform relationships with knowledge and people (Beer & Burrows, 2007) is able to balance classroom power to empower learner agency, autonomy and engagement through the support of informal conversation, reflexive dialogue and collaborative content generation (McLoughlin & Lee, 2010). In this study, web technologies are conceptualized as *tools* for mediating activities of learning and its interactivity.

The eSCLE recognizes the unique set of opportunities and limitations offered by web technology; integrating the appropriate web tools in a socio-constructivist learning environment. It is a learning environment represented by a balance of instructor and learner control and a balance of individual and social learning in an online milieu (Salmons, 2009). In the eSCLE, learners construct meaning from collaborative e-learning activities and instructors provide support to help prevent learner isolation or separation from the interactive process in online milieu. Web tools are used as scaffolding tools and thus selected with careful consideration together with an appropriate mix of delivery methods, in cognizance of the individual instructional strength inherent in each technology (Chen, 1997) as a facilitator to learners personalized needs (Huang, 2002).

The eSCLE is constructed to enable technology integration. According to Dias (1999), a technology integrated learning environment can happen in any location as long as it is constructed in a learning environment that is *"ripe"* for integrating meaningful learning; which Jonassen (1995) proposes for an active, constructive, collaborative, intentional, conversational, contextualized and reflective learning environment. Technology-integrated instruction creates a different kind of structure for learning and teaching, it does not use technology per se (Kearsley, 1998). Technology skills are applied in meaningful ways and used in a *"seamless manner"* to enhance learning (Dias, 1999). This study undertakes to examine *"the intersection of the affordances of information, technology, pedagogy and learning"* as a means to *"maximize the possibilities for student learning with technology"* (Windschitt ,1998:28); particularly for self-directed learning.

Conclusion

This chapter has reviewed theories that form a framework for the design of a socio-constructivist learning environment that integrates web technologies for the development of self-directed learning among adult learners. The literature review provides for theoretical and practical guidelines and examples of successful designs in various settings, which is adapted to this study's context (described in detail in Chapter 4) using appropriate research methodologies and designs, to be examined in the next chapter.

CHAPTER 3

METHODOLOGY

This chapter delineates and justifies the research methodology employed throughout the study which includes the research design, sampling, instrumentation, data collection and analysis. The chapter includes a discussion of how research quality and ethics are ensured in this study.

Research Questions

This study's methodology is designed to answer the following research questions:

i) How does the designed activity system facilitate the development of self-directed learning in an e- socioconstructivist learning environment (eSCLE)?

ii) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

iii) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

Research Design

For the purpose of answering the specified research questions, this study employs the design and development research design, deemed a scientific methodology that *"parallels the problem-solving process"* (Richey & Klein, 2007) and involves disciplined investigation to improve *"the thing being developed or the developer"* (Hasan, 2003:7).

The ‘developed thing’ refers to the development of self-directed learning within the design and development of the e-socioconstructivist learning environment (eSCLE); while the ‘developer’ is either the instructor-researcher or the learner at various phases of activity.

Design and development research is conducive to this study as it links research of self-directed learning theory and practice. Using a pragmatic and systematic study of design, development and evaluation processes, new tools or enhanced instructional design models are proposed in described contexts. From this view, design and development research is able to promote the scholarship of teaching and learning, allowing teaching to be attuned to research and allowing the practice to be informed by research (Richey & Klein, 2007).

This research involves the design of instruction for the development of self-directed learning among adult learners; after which the processes and conditions of successful and not so successful practices of the instructional design will be analyzed for future improvement.

A qualitative orientation is adopted to enable naturalistic and in-depth examination of the perceptions, instructional processes and learning experiences of the participants. The objective is to gain insight and lessons learnt from the procedures and conditions of the instructional design, while addressing the validity of processes and techniques employed which facilitates their use in the specified context. In other words, research findings are grounded in real practice and will be derived from there to add on to the *instructional design and development (IDD) knowledge base* described by Richey and Klein (2007) and illustrated in Figure 3.1.

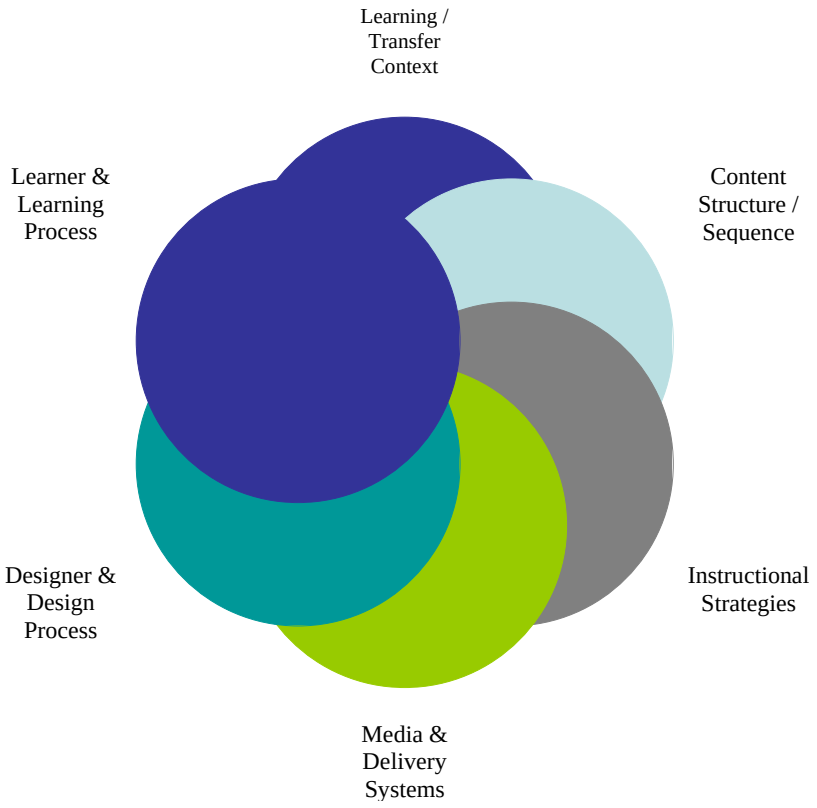


Figure 3.1 The IDD Knowledge Base (Richey & Klein, 2007)

Research and Instructional Context

The research is conducted within the context of higher education and the participants are postgraduate students enrolled in the Instructional Design and Development (IDD) course. The IDD course is a core subject towards a Master of Instructional Technology. This course introduces students to the basic principles and concepts of instructional design and development as a process to develop alternative strategies to solve problems related to teaching and learning. The topics include the processes in identifying problems in teaching and learning, which involves needs analysis, learner analysis, task and content analysis, designing and developing alternative strategies and materials to solve problems, and evaluating and managing the whole development process in line with the teaching and learning objectives.

The IDD course, in line with 21st century lifelong learning requirements, has subject-specific learning outcomes as well as transferable skills outcomes, which are outlined but not confined to the given alone, as following:

Content Learning: Outcome Statements

1. To describe the roles of instructional design in the field of education and human resource development;
2. To apply instructional design processes to solve problems related to teaching and learning;
3. To use an instructional design model to design, develop and evaluate a project of own choice;
4. To manage an instructional development project;

Transferable Skills: Outcome Statements

5. To communicate effectively and work well with others;
6. To critically analyse research, trends and issues related to the field of instructional technology;
7. To engage in lifelong learning and anticipate the impact that advancements in technology may have on tomorrow's learning; and
8. To develop and market innovative products of learning for diverse audiences and for delivery of instruction within a wide range of settings.

The subject-specific learning outcomes are guidelines but not inexhaustible lists of contents to be covered within the course.

The course employs a blended learning approach. Classes are held weekly through the 14-week semester, where the class meets face-to-face in a multimedia laboratory equipped

with internet-enabled computers. During the face-to-face classes, lectures are not common; a problem-based learning approach is administered. In between classes, self-directed learning among the community of learners are monitored through online technology tools; primarily via the institution's e-learning platform – Moodle's discussion forum, wikispaces, web tools (google docs) that host shared learning contracts and the social networking site Facebook.

Self-directed learning is explicitly mentioned as course learning outcome. This is communicated to the students through the stipulated 210 hours Student Learning Time (SLT). The concept of SLT is to encourage students to manage SDL and to plan for quality learning time throughout the course. Student learning time comprises official contact time, guided learning time, self-study time and assessment time (Figure 3.2).

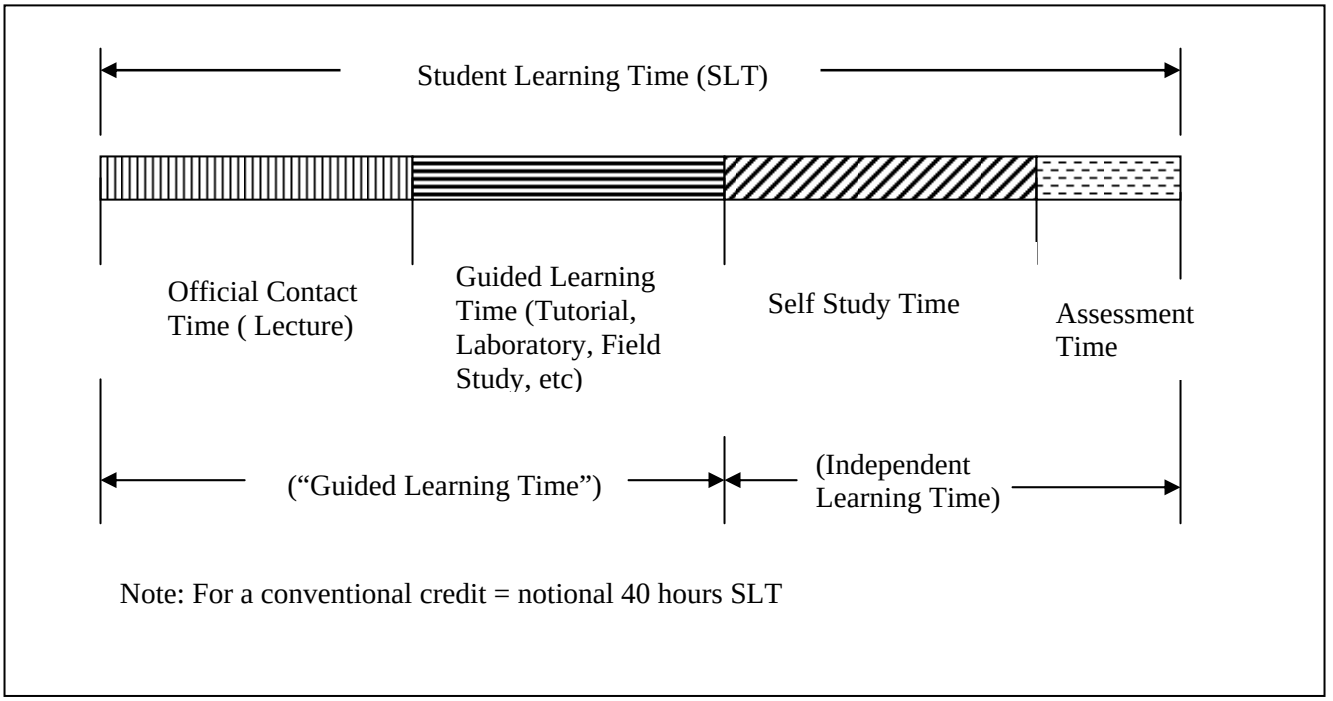


Figure 3.2 Student Learning Time Model (Zainai, 2006)

Sampling

Two levels of sampling are conducted in this study. The first level involves the entire population of 14 participants. This method is to capture the accurate representation of responses to the intervention as much as possible. All learners' background and learning profiles are surveyed through questionnaires and analysed to facilitate the design and guidance of self-directed learning that is social and constructivist in nature. Needs analysis have to be conducted as a whole since the instructional design requires students to work collaboratively in groups or pairs in all the assessment tasks. Intervention is administered based on whole population characteristics as participants are required to engage in the learning processes of self-directed learning (Refer to operational definition of SDL in Chapter 1).

The second level of sampling involves purposive and theoretical sampling for the interview and selective observations. In purposeful sampling, sample size is determined by *"informational considerations"* (Lincoln & Guba, 1985:202) where *"information rich"* cases are selected to facilitate in-depth understanding of the situation studied (Patton, 2001). 'Information rich' cases in this study are identified by learners who show keen initiative in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, selecting and implementing strategies, and evaluating learning outcomes (Refer to operational definition of SDL in Chapter 1) within the contexts of the activity system.

Purposive sampling of different participants at different stages is conducted until incoming information becomes redundant (Lincoln & Guba, 1985) and the researcher has gained access to an adequate range of participant perspectives and experiences. Purposive

sampling is chosen to capture ‘samples within the case’ (Merriam, 1998) that display variation, consistency and contradictions in responses (Kumar, Little & Britten, 2003). Translated into this study, learners who, at various phases, show significant development in self-directed learning and resistance to the implemented activity system (other than those who consistently manifest keen initiative in self-directed learning) are observed and interviewed to garner deeper understanding of factors contributing to the case.

As categories begin to emerge from data analysis, selected participants are further interviewed in a process of theoretical sampling (Glaser & Strauss, 1967) to further define and refine the properties of the category and for triangulation of emerging analysis. This procedure is done to clarify, verify and to further develop theoretical conclusions. Theoretical sampling is about selecting cases *“that are most likely to produce the most relevant data that will discriminate or test emerging theories”*, including exeptions (negative-case-selection) or variants (discrepant-case selection) to progress and drive theoretical conclusions (Bloor & Wood, 2006).

Participants

All fourteen participants are involved in the education industry as teachers and tutors. Twelve of them had formal training in teaching; with subject expertise in language and linguistic (n=4), computer science and technology (n=3), maths and science studies (n=2), management (n=2), early childhood (n=1), industrial design (n=1) and religious studies (n=1).

The 14 participants (of which three are males) and with ages ranging from 22 years to 44 years (Table 3.1) take on the role as instructional designers in this course.

Table 3.1 Participant Age and Gender

Age Group	Frequencies *(Gender)*
20-29	3 *(2M,1F)*
30-39	8 *(8F)*
40-49	3 *(1M,2F)*
Total	14 *(3M,11F)*

(M=male; F=female)

These adult learners come into the course with various learning and life experiences. The three older participants are senior teachers in their schools and hold management positions; participants in the mid-age range have significant experience in designing, organizing and giving trainings; while the three 'junior' participants were adept at technology skills and knowledge. The presence of two foreign participants (from America and Iran) enriched the sharing of experiences in a socioconstructivist learning environment; bringing individual, cultural perspectives in the interpretation of meaning.

Instrumentation and Data Collection Tools

Multiple data collection tools and methods are employed to add methodological rigour to the research, to extend and deepen analysis from different angles. Data from various sources are triangulated in the form of 'methodological triangulation' and 'data triangulation' (Denzin, 1989). Other than being tools for research, they also served as strategies to facilitate self-directed learning. For example, the Pre-Test Proficiency Profile (Appendix 8) and Empowerment for Engagement questionnaire (Appendix 9) were

completed by the students at the beginning and towards the end of the course to help the instructor plan, design and evaluate the learning experience that takes into account the needs and development of individual students. At the same time, the questions aim to provide self-awareness and strategies that facilitate students to reflect and evaluate their own learning. Feedback through data collection tools such as the learning contract, online discussions, course evaluation and reflection diaries were used strategically and periodically throughout the course to help students develop the metacognitive component of self-directed learning, as part of the individual or group learning process and progress.

Survey

Learners are required to complete two questionnaires, the student pre-test proficiency profile and the Empowerment for Engagement (Em4En) questionnaire as part of the module orientation. Both questionnaires are posted online on the class e-learning platform Moodle and compulsory for students to complete, for the researcher / instructor to gather background information which includes their age, highest degree, profession, experience with various online technology tools, prior experience in instructional design and beliefs in teacher-learner roles in an instructional process. Analyzed information help inform the design of self-directed learning instruction.

The Student Pre-Test Proficiency Profile (Appendix 8) has been tested and used among several cohorts of MIT students to help instructors determine strategies to personalize teaching and learning. On the other hand, the Em4En questionnaire (Appendix 9), developed exclusively for this research, was administered at the beginning of course as learning needs analysis, and towards the end of the course as an evaluation of learning. Specifically, learners' learning styles and readiness to learn in a student-centred approach

needs to be identified in the beginning as an effort to develop appropriate self directed learning strategies.

The first version of the survey questionnaire was pilot-tested with a previous cohort of teacher trainees to check the reliability and internal validity of the questions to produce consistent answers and to help the researcher modify the questions, rubrics and structure of survey questions appropriately before the real run. Procedures are adapted from Peat et al. (2002:123) as follow:

- The questionnaire is administered to the pilot participants in exactly the same way as it will be administered in the main study, i.e. at the beginning of the course through the online platform.
- Random participants are asked to record time taken to complete questionnaire and feedback (informal interview) is elicited from the subjects to identify ambiguities and difficult questions they experience.
- The researcher checks that all questions are answered and assesses whether each question gives an adequate range of responses.
- The research establishes the potential of questions to produce replies that can be interpreted in terms of the information that is required.
- The researcher re-words or re-scales questions that are not answered as expected; discards all unnecessary, difficult or ambiguous questions.

The key findings from the pilot test and ammendments made to rectify the ambiguities are summarized in Table 3.2.

Table 3.2 Evaluation Processes in the Pilot Testing of the Em4En Questionnaire

Section	Key Findings	Feedback / Evaluation	Ammendments
1	Some participants listed all certificate qualifications.	They find it unnecessary and troublesome to list all qualifications – although this was not expected.	To add 'Highest' to the rubrics 'Qualification' and provide an example – Bachelor of Arts.
1	There is a need to find out participants' individual experience in Instructional Design.		To add a last question (open-ended) – 'Any ID experience?' so participants can elaborate.
2	Some participants circle both T and L as the given learning processes was too vague without explanation.	They believed that the roles may overlap in different contexts.	To append contexts for various learning processes based on Hiemstra (1994) - (Appendix 6)
2	Some participants specified T *and* L, indicating at the margins the differences of roles in pure online distance learning or blended learning situations.	They were confused with the definition of online learning environment.	To omit 'online learning environment'.
2	Some participants (as in situation above) jotted down notes to clarify	They want their perspective to be	To include space for open-ended

	their choice.	heard, as a way to get the instructor to know their needs.	responses.
2	Participants were not able to provide illustrative contexts which was hoped to provide examples of best practices for the target participants.	Some participants lament the lack of time. Others the lack of experience.	Leave out the 3 questions.
2	The responses were not focused and not worthy of interpretation.	They had no context to anchor their discussion upon. Some confessed the lack of language proficiency to express themselves.	To probe / observe the genuine answer from participants throughout the semester in the role of researcher participant rather than through a survey questionnaire.
2	Some participants omitted several questions.	They did not feel the need to think deeper into selected questions.	There is a need to set important questions as ‘compulsory fields’ on the online template to reduce the bias of non-response.

Field Observation

The researcher was present on the site (physical and virtual learning environment) throughout the 14-week semester to examine and collect data, to implement interventions or the application of skills and knowledge to the group. The role of the researcher was that of a researcher participant *"who participates in a social situation but is personally only partially involved, so that he can function as a researcher"* (Gans, 1982:54). The researcher had to balance the role of the insider (in order to examine phenomenon) with the role of the outsider (so that the presence does not affect the natural behaviour of the groups).

Observations are conducted throughout the course with a combination of narrow and broad focus. A broad focus considers a holistic view of the entire program while a narrow focus looks into selected details of a sample population. Some sensitizing concepts observed are:

- Facilitation
- Implementation of instruction / training
- Learning processes
- Learning outcomes
- Learning products
- Learning impacts

Accompanying the observation, field notes (Appendix 4) are jotted to record information such as:

- Space: the physical place or places
- Actor: the people involved
- Activity: a set of related acts people do
- Act: single actions people do
- Object: the physical things that are present
- Event: a set of related activities that people carry out
- Time: the sequencing that takes place over time
- Goal: the things people are trying to accomplish
- Feeling: the emotions felt and expressed

(Beckman & Barry, 2007:36)

Descriptions, direct quotations and observer comments are noted as supporting data. Due to the limitations of the researcher-teacher-observer role, notes could neither be jotted continuously at all times. Hence, the strategy was to pay attention to both broad and narrow lens, shifting focus when needed, paying attention to key words, remembering the substance of an action or conversation and then mentally play back remarks and scenes during breaks, or if not possible, as soon as the class is over, record memos and field notes.

Document / Content Analysis

There are a variety of written and spoken artifacts accumulated throughout the course, containing valuable data, which are:

- discussions between teacher-learner and learner-learner (on Moodle, Google Wave, facebook),

- participants' shared learning contracts (on Google Docs),
- group project and reflective diaries (wikispaces and Google Sites),
- course and design information (proforma, worklog,) and
- debriefings (field notes)

These artifacts are a product of the context in which they were produced and therefore grounded in the real world. Guba and Lincoln (1981:234) assert that such naturalistic inquiry *"lends contextual richness and helps to ground an inquiry in the milieu of the writer".* These significant documents were gathered and stored electronically for retrospective analysis.

Interview

As the participants had already presented public accounted views in various online and face-to-face contexts, these need to be triangulated with private accounts of experiences. This study takes a balanced view of the simplistic generalization that public accounts are always 'false' and private accounts are always 'true' and vice versa; by acknowledging that public accounts are *"given for a purpose"* as the respondents' representation of the real world and correspondingly conducting the interview skillfully to investigate public accounts *"for what they are"* and *"to probe beyond the private beliefs and behaviours*" (Bloor & Wood, 2006:142). In order to 'probe beyond the private beliefs and behaviours', trust and good fieldwork relationship is gradually built with participants, in order to access 'private accounts' that reflect the truth of their experience.

Instances of informal interviews were conducted in private with individual participants to get confirmation or verified response following public accounts from documents listed before. Interview questions were semi-structured (Appendix 2) and prepared according to categories of interest. They were used as a guide in the facilitation of discussion and conducted using facebook chat (Appendix 2) within three months after the end of the course. The group or focus group interviews were not favoured in this context, to avoid respondents' preoccupation with presenting themselves as socially acceptable to other members of the group (Phoenix et al., 2003). Electronically conducted interview is preferred as it provides readily accessible documentation, (Gaiser & Schreiner, 2009), saves time and eliminates errors in transcription, with the additional depth of substantive response with the additional thinking time (Gaiser, 2000).

Data Analysis

Data analysis in this study was iterative and emergent, occurring simultaneously with data collection and data processing to facilitate check-and balance procedures, in helping minimize biases and errors alongside fieldwork and fine-tune research methods as appropriate. There were ongoing analyses happening at two levels: i) of the activities going on within the designed learning environment using the activity systems analysis methods (Yamagata-Lynch, 2010) and ii) of the data gathered from various instrumentation above using constant comparative analysis (Strauss & Corbin, 1998). The integrative analysis at two levels is to approach the dissection of interactions in a real-world complex learning situation from the perspectives of the instructor (provider of the design) and learner (receiver of the designed); and also to examine the internal (psychological) and external (physiological) aspects of designed learning experience.

The activity systems analysis is an operational representation of activity theory (refer to Chapter 1), and is employed to address mediational issues in instructional design, capturing multi-mediational processes in human activity (Engeström, 1987) through information that enlightens the research about participants' mediational processes in response to the instructional intervention, that identifies systemic contradictions and tensions which shape developments in educational settings and that enables the examination of individual activity in relation to its designed contexts (Yamagata- Lynch, 2010). The activity systems analysis requires the researcher to vicariously experience participants' activities and examine individual behaviour in its contexts (Yamagata- Lynch, 2003) that are critical to answering the research questions.

Constant comparative analysis is inductively conducted on collected raw data so that new meaning could be drawn from the context (Glaser, 1965). In this method, coding and analyzing are concurrent processes so that one piece of data (eg: one interview, one statement from observation or one coded category) could be compared to other pieces of data for its similarities or differences, and in the process emerging a set of rule, concept or theory that explains the situation. The constant comparative method of analysis basically involves four stages: comparing incidents applicable to each category, integrating categories and their properties, eliminating the theory and writing the theory (Glaser & Strauss, 1967).

Activity Systems Analysis

Activity systems analysis is conducted by analyzing the data set into units of bounded systems using foci tools such as activity settings and planes of sociocultural analysis. Activity settings are the social environment that provides the context in which activities

take place (Tharp & Gallimore, 1988) while the planes of sociocultural analysis is a theoretical tool that provides a framework for investigators to identify bounded units of activity based on the subject who is engaging in the object-oriented activity or goal-directed action (Rogoff, 1995). In this study, activity system analysis is conducted based on four activity settings: R&D ID Project, instructional video task, shared learning contract, assessment (Example in Appendix 5).

In the analysis, the researcher identifies the activity setting and zooms in and out of four planes of sociocultural analysis (Table 3.3). The technique is called *"blurring"* which involves focus on one plane of analysis at a time while not ignoring the other three; specifically to identify the salient features of the planes that are not being examined but are essential and relevant to the study to help further appreciate the complex activities that take place on the zoomed-in plane of analysis (Rogoff, 1995).

Table 3.3 Overview of the four planes used to analyze the actions and operations of learners in the designed activity system

Plane	**Analytic Focus**
Personal	How individuals self-direct their learning through involvement in the activities
Interpersonal	How individuals self-direct their learning through collaborative activities with others
Institutional / Community	How individuals self-direct their learning as they interact in community-based activities
Technology	How individuals self-direct their learning as they interact with web-based technologies

(Adapted from Rogoff, 1995)

This study analyzes both the course level object-oriented activity (teacher designed instruction) and student level individual and collaborative goal-directed actions, to identify any systemic contradictions that affect participant engagement in self-directed learning in the designed learning environment.

Specifically, questions based on the Eight-Step-Model (Marken, 2006; Mwanza, 2002) were used to identify and analyze instructional design requirements that will facilitate the development of self-directed learning in an eSCLE through the guiding questions (Table 3.4).

Table 3.4 The Eight-Step Model used to analyze the development of SDL in the eSCLE

1. What *tools* do the *subject* use to achieve their *objective* and how?
2. What *rules* affect the way the subjects achieve their *objective* and how?
3. How does the *division of labor* influence the way the *subjects* satisfy their *objective?*
4. How do the *tools* in use affect the way the *community* achieves the *objective*?
5. What *rules* affect the way the *community* satisfies their *objective* and how?
6. How does the *division of labor* affect the way the *community* achieves the *objective*?

(Marken, 2006; Mwanza, 2002)

Constant Comparative Analysis

In this method of analysis, the researcher compares data sets from research sources (observation field notes, interview transcripts, debriefing transcripts) to find answers to the questions structured upon the activity systems analysis. Similarities and differences are

identified through three stages of coding: Open coding, axial coding and selective coding. The unit of analysis may range from a word, a phrase, a sentence or a paragraph.

Initial comparison is done on data within single source (eg: interview transcript of one participant, field note of one session or survey results from one participant). The researcher begins by highlighting and making notations as margin notes, coding data in the smallest possible unit, either the margin commenting feature in word processors (Appendix 24) or on the actual physical documents such as observation field notes (Appendix 4). The initial stages of open coding are to leave a line of enquiry to provide structure for subsequent analysis. Furthermore, if there are overlaps in characterizations, the researcher decides if that can be merged into another coding or should be parsed into another smaller unit. Through examination and reexamination of data in *"conceptual stepping-back process"* (Strauss, 1987), the initial codes and definitions may change to form mutually exclusive categories. Examples of some initial codes from the interview transcripts, observation field notes and debriefing transcripts are: 'knowledge', 'skill', 'confidence', 'experience', 'torn between', 'goal', 'awareness', 'no answer', 'fear', 'chaos', 'problem', 'difficult', 'find out', 'think', 'work together', 'support', 'learning', 'process', 'adapt', 'transform' (Appendix 25).

Following, the researcher begins to look for larger categories of themes through axial coding, where categories of codes identified during open coding are subjected to intensive analysis that *"revolves around the axis of one category at a time"* (Strauss, 1987:32). From this stage, the researcher compares data between sources (eg: between all interviews, between all participants' debriefing, between all observation field notes and between the sources of interview, field note and debriefing) around the axis of one research question, to

find out the relationships and interactions between the initial categories. The relationships among some codes are discovered. For example, the codes ‘fear’, ‘chaos’, ‘problem’ and ‘difficulty’ revolves around the axis of the first research question whereby tension exists in the activity system causing the learners to encounter fear, chaos, problem and difficulty (RQ1); ‘find out’, ‘think’, ‘work together’, ‘support’ revolves around the axis of the second research question whereby web technology are tools to help the learners overcome the tensions (identified in RQ1) by activity of finding out, thinking, and supporting each other through working together (RQ2); ‘learning’, ‘process’, ‘adapt’, ‘transform’ revolves around the axis of research question three whereby the process of learning to adapt to the activity system is a transitional or developmental process towards transformation of self (RQ3).

In the final stage of selective coding, the researcher selects a core family of codes that carries the message about what is learned from the analysis that is relevant to the investigation (Strauss, 1987). The iterative stages of coding could recur at any stage as the researcher finds newly identified codes, codes that need to be eliminated or definitions that need to be refined. These categories are flexible and non-exhaustive until the stage of saturation; at which stage emerged learning conditions indicated in six contradictory constructs (RQ1), eight functions of the web tools (RQ2) and five transitional phases that facilitate self-directed learning in the designed activity system (eSCLE). (Detailed discussion of results from final coding in Chapter 5)

Artifacts subjected to content analysis using the constant comparative technique were the project diaries (wikispaces), learning contracts (googledocs), discussion forum (moodle), interview transcripts (facebook and email).

Below is an overview of the stages in data analysis:

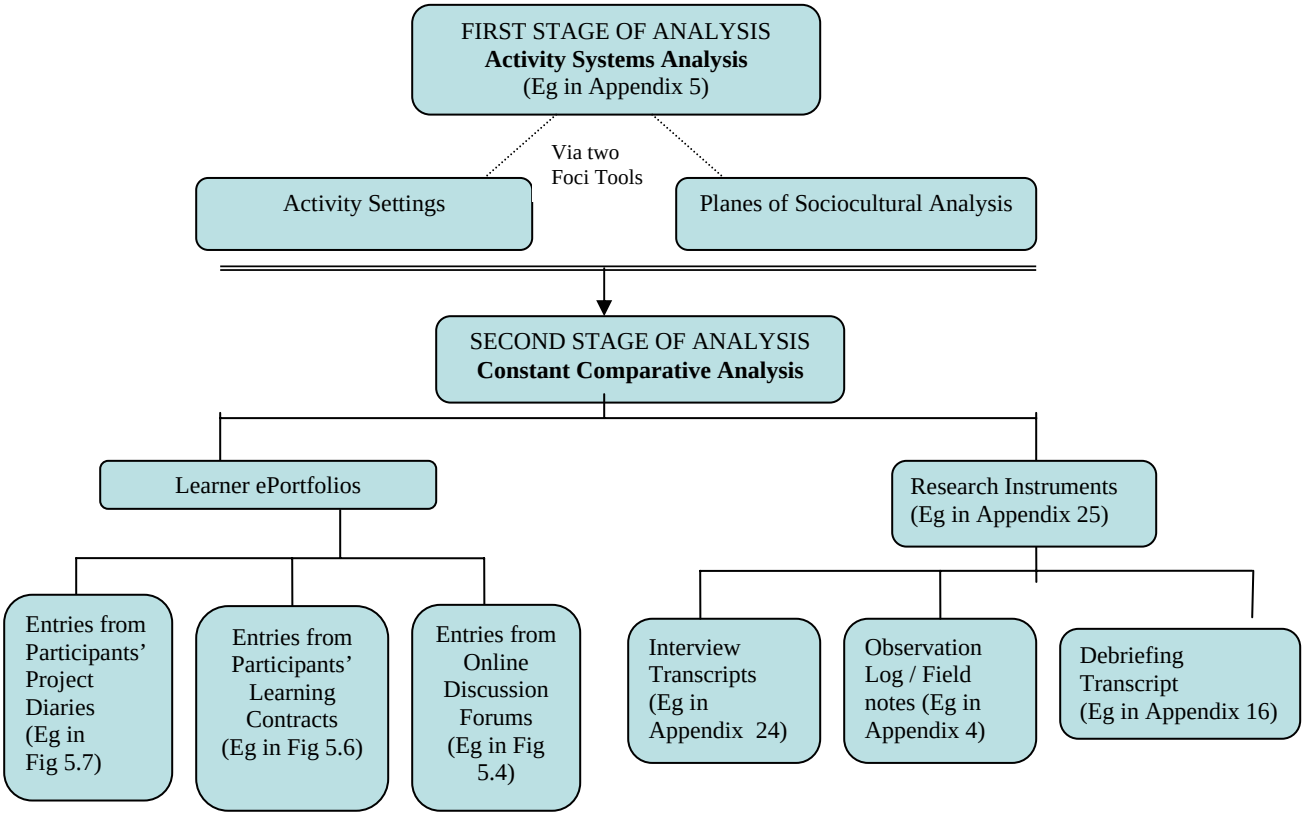


Fig 3.3 An Overview of the Stages of Analysis

Ensuring Research Quality

Validity and Reliability

From a qualitative perspective, validity concerns the ability to provide an improved understanding of the research subject(s) and unique impressions of events rather than improved accuracy for generalized findings (Denzin, 1989; Creswell, 2007). Therefore, the main aim in this study is to take the relativist position (contrary to positivist) where there is belief of multiple perspectives of the social world and these are constructed by the research process. In this view, deviant cases are included if it is able to contribute to interpretations that answers the research questions. In this study, the researcher is continually searching for 'authenticity' (Guba & Lincoln, 1989) to produce a valid research.

In light of design and development research, validity is also established with the expert review and guidance from the co-instructional designer and developer, who is experienced in the field instructional design and technology and research in instructional technology. The researcher implements intervention under close observation from the expert member.

On the other hand, reliability is observed by minimizing bias issues in data collection. Multiple sources of data, collected via carefully structured data collection instruments are used. In-progress data needs to be collected and analysed immediately and regularly to avoid rushed and premature interpretation. Verbal and written data are captured as 'thick description' to provide rich and multilayered interpretations to both the researcher and readers. Finally, the researcher practises reflexivity in documenting data collection and analysis. This is done by being aware of the relationship between, and influence of, the researcher and participants, which enables the researcher to take bias control steps.

Research Ethics

In the context of archived online databases, it is argued that the question of privacy is not in existence (Gaiser & Schreiner, 2009) due to *"implied license" within copyright law* where the intention to post online is for others to read and save it (Mann & Stewart, 2000:46) and the fact that electronic environments are open to others to access data (Williams, Rice & Rogers, 1988).

According to Mann and Stewart (2000:46), communication could be distinguished between private, semi-private and public data and it is only in the case of *"intentional interaction (Private and semi-private communication)"* that "*informed consent precedes the use of data governing the ways in which the data can and should be used".* Consequently,

researchers should determine the acceptable practice in their own field (Gaiser & Schreiner, 2009).

In this study, the learning experience is designed to protect the participants, with online asynchronous platforms (Moodle, wikispaces, GoogleDocs) in this study secured with passwords and access is restricted to the course group. Apart from that, the nature of this research does not study individuals' self-directed learning but the instructional design or activity system as a whole. However, for the purpose of research ethics in ambiguous circumstances, informed consent is still obtained from all the participants after ticking the checklist of intrusiveness, privacy, vulnerability, potential harm, confidentiality, intellectual property rights (Figure 3.4). This is to protect participants' rights of knowing, to ensure privacy, anonymity and confidentiality in terms of reporting personal data and to give them the assurance to give views that are authentic representation of their positions; in other words valid opinions. Some other ways participants' identities are protected is to use pseudonyms for names and communities and to delete or mask compromising details as much as possible to make characters less identifiable.

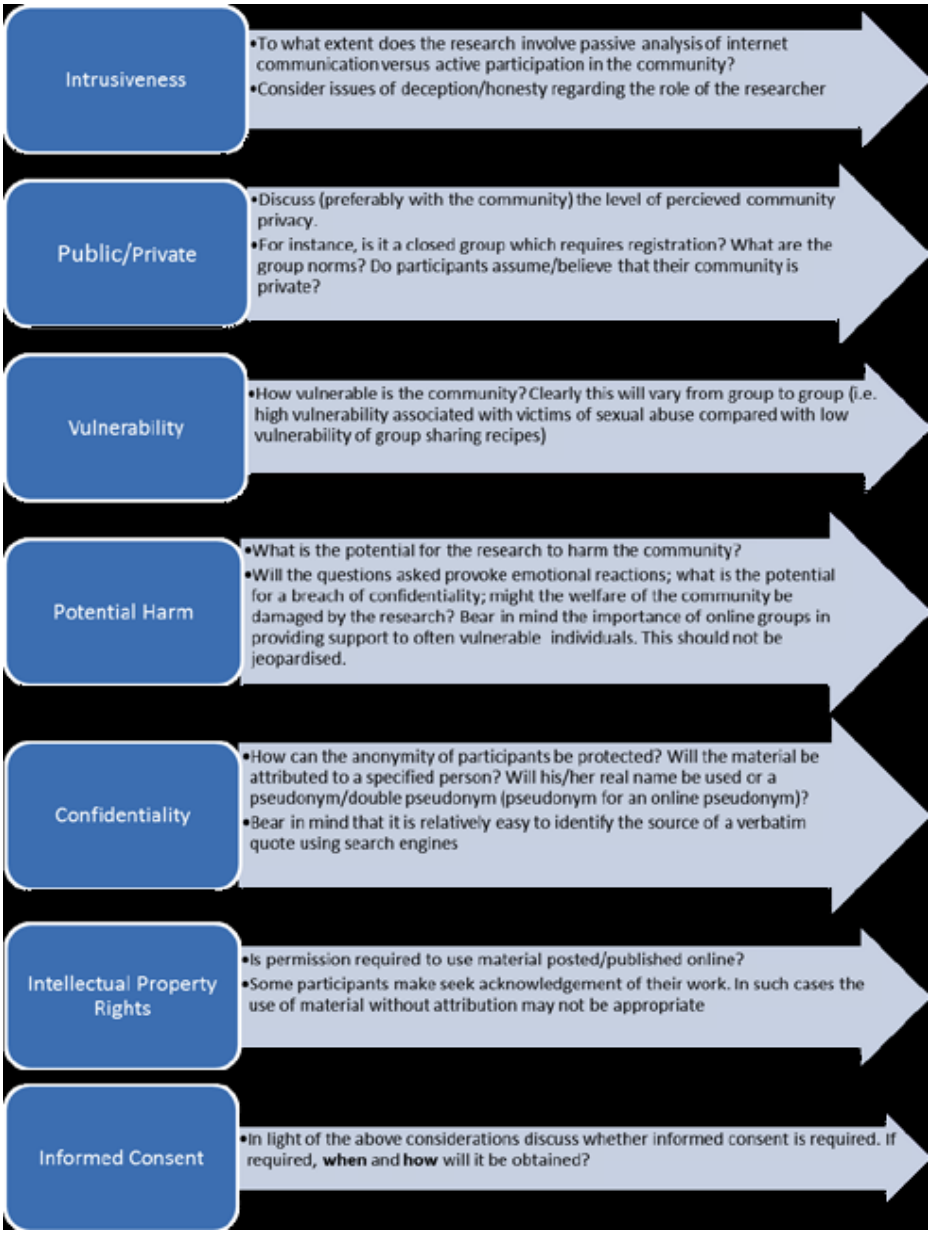


Figure 3.4 Checklist to guide ethical considerations for internet-based research

(Convery & Cox, 2012:55)

Conclusion

This chapter has described the methodologies of Design and Development Research (DDR) that were used to answer the set out research questions. These include research design, sampling, instructional and research contexts where data collection and data analysis is conducted. With regards to the pervasive use of the internet (i.e web-based technologies), ethical practice is ensured from the perspective of both traditional and internet-based research. Methodological integrity is also discussed from the validity and reliability point of view. The next chapter will detail the instructional contexts of the design and development process, based upon the methodology processes discussed in this chapter.

CHAPTER 4

DESIGN AND DEVELOPMENT

The procedures of design-based research are culturally and contextually complex due to the involvement of various stakeholders and sociocultural elements in the research settings; warranting this topic a chapter on its own, to discuss in detail the contextual design and development processes; including the stakeholders, teaching strategies, learning activities, assessment and the theoretical justifications that bound the design and developmental decisions of an e-socioconstructivist learning environment conducive for self-directed learning.

Research Questions

The design and development of this study seeks to answer the following research questions:

i) How does the designed activity system facilitate the development of self-directed learning in an e- socioconstructivist learning environment (eSCLE)?

ii) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

iii) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

Design Framework and Process

The design for self-directed learning is guided by the Integrative Learning Design (ILD) framework (Figure 4.1) through the lens of the activity system theory (Figure 1.2). This framework is employed in consistence with the notion of instructional design as a research rather than merely a procedural process. Theories and design activities are integrated, rather than applied, in an iterative process (Jonassen, Cernusca & Ionas, 2007).

The ILD is a constructivist adaptation of the generic ADDIE model (which is used in more systematic and linear instructional design), used to develop effective learning environments using software and other artifacts (Bannan-Ritland, 2003). The three main phases of ILD are exploration, enactment and evaluation (Figure 4.2) while the three components of pedagogical models or constructs, instructional or learning strategies and learning technologies provide the tools and information required for the exploration, enactment and evaluation phases (Bannan-Ritland, 2003).

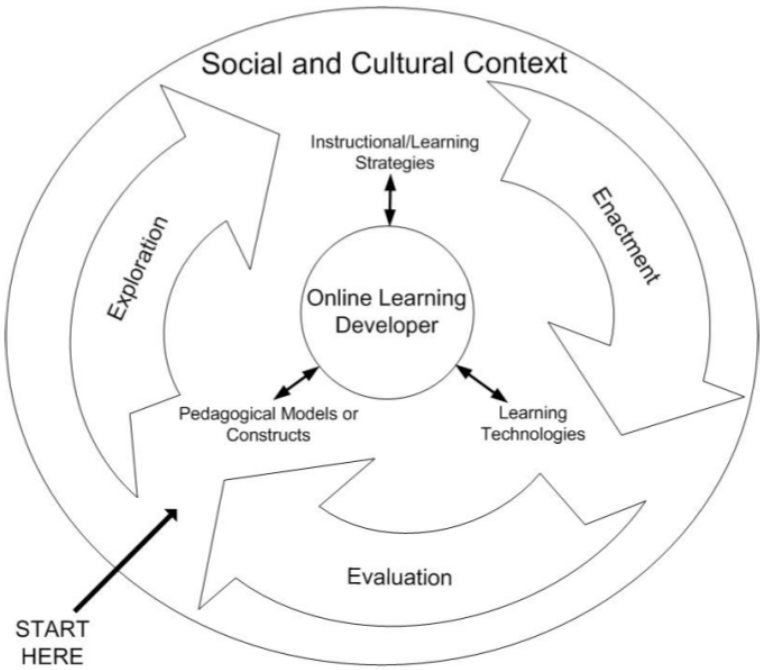


Figure 4.1 Integrative Learning Design (ILD) Framework (Bannan-Ritland, 2003)

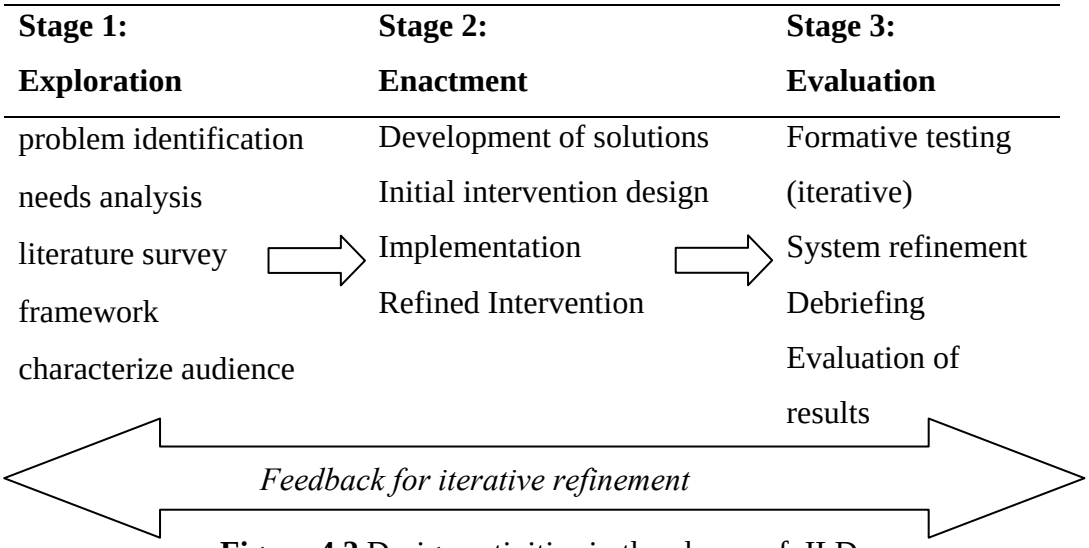


Figure 4.2 Design activities in the phases of ILD

Exploration Phase

The exploratory phase of the research occurs before or at the beginning of the course. Informed exploration involves initial investigations into the needs of the higher education community in terms of learner control in instructional settings. The pedagogical constructs developed from literature survey in related fields of SDL, ID, socio-constructivism and technology integrated learning environment (described in Chapter 2) provided a framework for plausible paths of design. The identified instructional problem (gap) of enhancing the development of self-directed problem solvers among adult students was addressed through the design of a self-directed module, based on researched pedagogical models or constructs, established instructional / learning strategies and appropriate learning technologies.

During the first class meeting, the needs of the target learners were assessed. The Em4En questionnaire, comprising a section of closed-ended and open-ended questions respectively (Appendix 9), was given out to analyze the needs of adult learners in terms of control in a technology-integrated instructional environment. The needs analysis questionnaire was

developed upon the premise that learners are able to assume some control in various aspects of the learning process (Hiemstra, 1994). Hence, using Hiemstra's suggested framework (Appendix 6), the adult learners' beliefs on roles and responsibilities in web-integrated learning environments are surveyed. The questionnaire was piloted with another cohort who were also adult learners involved in education industry; resulting in modifications to reduce ambiguity in rubrics interpretation and for open-ended questions that yield significant response (Discussed in Chapter 3). As the Em4En questionnaire is distributed via Moodle, responses from the learners are compiled using Moodle's 'Questionnaire Report' function (Appendix 10) and analyzed retrospectively. The other questionnaire surveying learner profile (Appendix 7) was administered together with the Em4En Questionnaire to collect demographic data, identify individual learning preferences and strategies, proficiency in emerging technology skills, informal learning habits and the environment and prior knowledge in instructional technology-related domains, for personalizing self-directed instruction. Qualitative results from the responses are used to guide relevant intervention, summarized in Table 4.1.

Main findings from the survey questionnaires showed:

i) Divergent preferences in terms of learner control, however more than 50% of learners believe teachers should assume more control in the various instructional processes,

ii) Only about 35.7% (n=5) learners reported zero experience in instructional design. Others have ID experience from previous courses, work-based ID projects, curriculum development experience or teaching practice.

iii) Literacy in technology is high as almost 100% (n=14) learners own several technology tools (eg: personal computers, thumbdrive) and have relevant

computer proficiencies in common applications (eg: word processing, presentation tools).

iv) On the other hand, not everyone has experienced online learning in an instructional setting (teaching or learning). 57% (n=8) of learners have online learning experiences ranging from 11 months to more than 5 years. Interestingly, 93% (n=13) of familiarity with facebook and 86% (n=12) with wiki is reported, indicating the ready potential of learning collaboratively with contemporary web tools.

Table 4.1 Indicators Informing Intervention in the Exploratory Phase

Indicators from Exploratory Phase (Survey Findings)	**Initial Intervention in Enactment Phase**
Self-directed learning needs to be guided for at least half of the learners as they expect the instructor to take more control of the (seven) classroom learning processes.	Grow's (1991) Staged Self-Directed Learning Model (SSDL)
Majority of the learners have experience in instructional design; some via on-the-job experience and others through project work in university. The ability to describe their experiences shows that the learners concerned were aware of the basic functions and concepts of instructional design.	To develop authentic ID scenarios; for professional problem solving in complex and dynamic situations.

Almost all of the learners were familiar with the web technologies (wiki, moodle, blog, facebook); with many having knowledge of utilizing various media tools, authoring tools, social networking sites.	Web technologies to be integrated as mediating tools to scaffold self-directed learning.
Due to the range in age, work job descriptions and societal roles, the learners possess varying expertise and interests.	Learners could be resources to each other; therefore to empower self-directed learning through the design of a heutagogical learning environment.

Enactment Phase

Based on initial theoretical conjectures and comprehensive needs analysis, the initial intervention design was rolled out (Table 4.2). Learners were introduced to the real client (from PUSMAL) for their Research and Development Instructional Design (R&D ID) project during the first class meeting, where they will provide instructional design services in terms of transformation training program for graduate entrepreneurs. The training component to be prepared comprises of knowledge and basic entrepreneurial skills and attitudinal characteristics of entrepreneurs in symbiotic relationships (Appendix 20).

Positive Outbreak / Seed is an organization under the wings of PUSMAL that has taken up the task of providing for a comprehensive entrepreneur development program to be used as a reference point for young entrepreneurs seeking for knowledge and network. Collaborating with this cohort of learners from the 'Instructional Design and Development' (IDD) class and the Academic Development Centre (ADeC) of University Malaya, a pilot

training session for young entrepreneurs (comprising undergraduate and postgraduate students) is planned, designed and developed (Program Outline and Itinerary in Appendix 21). Lectures and workshop are conducted to convey topics such as entrepreneur criteria, creativity and innovation, marketing for entrepreneur and business plan.

In order to stimulate a sense of responsibility for own learning, learners were inculcated with the inquiring mindset through an initial Q&A session; which aim to build their own understanding regarding the requirements of the task. After dividing themselves into groups, a learner initiated a session of class discussion. There was good management and negotiation of feedback in response to the socio-cultural setting consisting of various stakeholders.

Table 4.2 Indicators Informing Intervention in the Enactment Phase

Indicators from Enactment Phase	**Detailed Design in Enactment Phase**
The initiative of a learner in leading class discussion proves the capabilities of the learners to progress ahead of the 'Staged Self-Directed Learning (SSDL)'.	To implement a "design within design" i.e. to become self-directed, learners need to be self-directed.
The instructor senses learner anxiety in the Q&A session with the client. Learners need some 'certainty' in the complex and dynamic (i.e. ill-structured) learning context.	To implement a task-centred instructional strategy based on First Principles of Instruction, which represents a form of direct instruction in the context of real world problems (Merrill, 2007).

As part of the instructional strategy (to be discussed below, see eg: Figure 4.3), learners collaborate on the main task (whole task) of R&D ID project while managing parallel assignment tasks that develop component skills for the main task. The parallel tasks that develop component skills are the instructional video development project and the shared learning contract. Both the tasks are implemented with the 'design within design' concept in mind; where learners learn to become self-directed learners by experiencing self-directed learning. Hence, learners determine their own gaps in understanding and build up their ID knowledge base from the existing level of competence or understanding. ID knowledge gleaned from completing component tasks would provide the necessary schema required of the whole task. The self-directed acquisition and assimilation of ID knowledge and skills enables the learners to adopt / adapt operational ID theories and models. Similarly, the shared learning contract task provides an avenue to deepen reflection and understanding of the ID principles through a formative and collaborative effort. The 'backchannel communication' helps sustain the learner self-directed effort in handling the challenge of the whole task.

Pedagogical Models and Constructs

One of the pedagogical models used to engage learner self-directed learning is Merrill's (2002) First Principles of Instruction (Table 4.3). Web tools such as *moodle, wikispaces* and *googledocs* are integrated into the course to facilitate self-directed learning through the phases of learning.

Table 4.3 Implementation of self-directed learning based on Merrill (2002)

Phases	Feature	Implementation
Activation	existing knowledge is activated as a foundation for new knowledge	The client presents the background to their problem. A brainstorming session, led by a student facilitator takes place to identify instructional problems and needs of the client. The teams are given time to organize any new knowledge by recalling, relating past experience as foundation for their new task.
Demonstration	new knowledge is demonstrated to the learner	Representatives from PUSMAL are available for Q&A sessions to help the teams visualize each team's contribution to the larger picture. The instructor explains some basic ID principles to jumpstart the learners' self-directed learning. Learners are directed to relevant readings and resources posted on the class learning management system *Moodle*.
Application	new knowledge is applied by the learner	There is diminished side-by-side coaching by the clients or instructors. The instructor elicits performance from the learners. Progress reporting takes place in the physical learning space during face-to-face meetings; and the virtual learning space - teams keep a diary and reflect as a group on *wikispaces* and individual reflection is documented in an online shared learning contract hosted on *google docs*.
Integration	new knowledge is integrated into the learners' world	Learners share skills or knowledge required for the tasks. Peer-led SDL sessions take place online and face-to-face. For instance, a crash course was collaborated online and then consolidated in a physical training session where a student took on the role of facilitator in a video editing training session using 'Adobe Premier Pro' software.

The self-directed learning phases are conducted in a performer-centric environment where learners as the central agent of action and control, perform activities in a heutagogical approach. Heutagogy, newly introduced in the 21st century by Hase & Kenyon (2000), could be seen as a higher level of self-directed learning, where learners' development of autonomy and maturity gradually enables them to *self-determine* their learning path in terms of engagement, cultivation and realization. (see Figure 4.3).

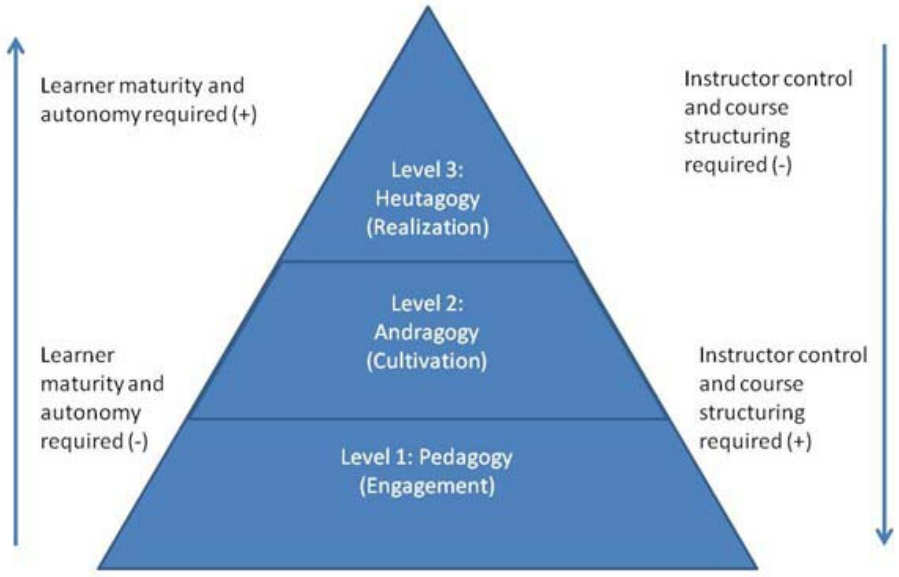


Figure 4.3 Heutagogy as the progression of engagement, cultivation and realization of learner self-directed learning (Canning, 2010)

Adapting several heutagogical principles, changes are implemented in the learning environment in terms of student role, teacher role, content management, curriculum design, social relationship, technology use and assessment method (Table 4.4).

Table 4.4 Employing a heutagogical learning approach to develop SDL

Instructional Features	**Traditional Learning Environment**	**Heutagogical Learning Environment**
Student Role	Share information	Self-determined goals in relation to course goals
Teacher Role	Present information; Manage classroom	Empowers student learning, provides key resources, design learning opportunities
Content	Basic literacy with higher-level skills building on lower-level skills	Meaningful, purposeful learning experiences which are relevant to learners' needs
Curriculum Characteristics	Focus on covering breadth Fact retention Fragmented knowledge and disciplinary separation	Flexible curriculum with double-looped learning opportunities
Social Characteristics	Independent learning	Independent and collaborative learning
Role for Technology	Drill and practice Direct instruction	Used as tools to facilitate self-regulated learning in collaboration within a learning community
Assessment	Fact retention Traditional tests	self-diagnosis, peer review, knowledge application, pre-prepared test, ongoing.

Within this framework, the instructor facilitates the students' learning process around a course-determined broad content. The learning activities within the curriculum are designed and structured in order that learners can exercise their capabilities in knowledge formation according to their self-determined goals.

Development of Instructional/Learning Strategies

In order to personalize self-directed learning in optimal learning conditions, a blended learning environment consisting of various event-based activities was prescribed. Other than the weekly face-to-face classroom learning, learners' development (of learning to learn) is monitored via various e-learning platforms (See 'Learning Technologies' section below).

A Project-Oriented Problem Based Learning (PoPBL) approach (a merge between project / task based and problem based learning) structured learning activities in a contextually fit manner, so that learning occurs as close to what is needed in professional practice and real life hence enhancing transfer of knowledge. Instead of learning a dictated broad curriculum, learners' learning journey departs from the point of their prior understanding. Their self-determined goals, which they reflect and revise regularly in their shared learning contract, help to promote personalized elaboration of knowledge through deep learning as they are achieved according to own pace of learning and self-determined target dates.

Additionally, learners were probed with stimulating questions in the blended learning environment to foster engagement through inquisitive learning. This was done through constant monitoring and evaluation of learners existing knowledge, through guiding learner to identify the gaps in their knowledge hence their own learning goals. The instructor encouraged reflective discussions at all times where learners articulate perceptions, examine contentions and question ambiguities in the established community of inquiry. In promoting this, it was the intention of the instruction to go beyond simple acquisition of skills and knowledge imparted from authority but rather to emphasize the

sociocultural learning experience of building understanding through inquiry in the context of lifelong skills of learning, unlearning and relearning.

Being aware of complications related to implementation of the PoPBL approach (as reviewed in Chapter 2), a task-centred instructional strategy (Figure 4.3) is employed to reduce the perceived cognitive load (discussed in Chapter 2) of introducing a whole task derived from a real complex problem. The scaffolding process involves the break-down of problematic whole tasks into part-tasks (components) in manageable tiers of difficulty. To develop self-directed learning, the composite whole task (R&D ID project) is demonstrated to the learners first. The R&D ID project (Appendix 13) focuses on both the macro-design procedures, which provide overall direction to a design project and micro-design procedures, involving the design of intervention strategies.

After a clear understanding of the macro task requirement, learners fragment the whole-task requirement into meaningful components (eg: ID models in training) and integrate the newly learnt skill / knowledge into solving the problems in progression, under diminishing guidance. Guidance is provided by instructors and peers through shared learning contract.

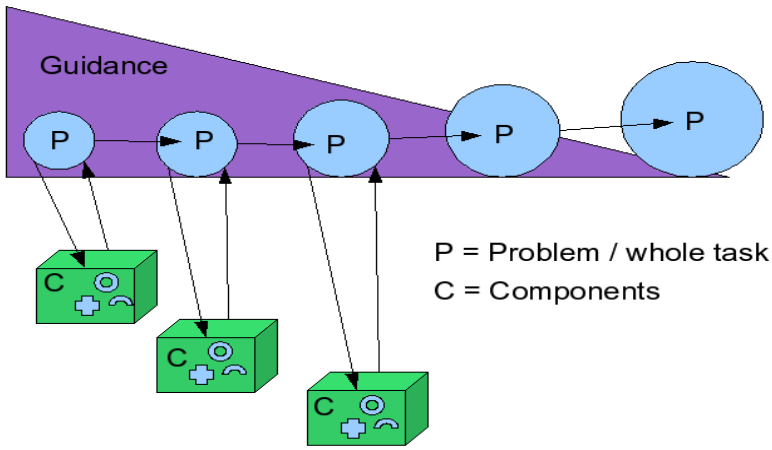


Figure 4.4 Scaffolding self-directed learning in the eSCLE (Merrill, 2003)

The shared learning contract (Appendix 15) is an assessed component of the course for learners to experience self-directed learning, by diagnosing personalized learning needs, formulating meaningful learning goals, identifying relevant human and material resources for learning, selecting and implementing appropriate learning strategies, and evaluating realistic learning outcomes as set out. The purpose of introducing the shared learning contract is to personalize learning for self-directed learning; in cognizance that every learner may have: learning goals that do not converge completely with instructional goals, different learning styles or different background knowledge. Hence, learners need to develop important metacognitive skills for self-directed learning through self-regulated reflection to help them:

- assess tasks requirements
- evaluate how well they are equipped to do the task
- plan an appropriate approach
- apply selected strategies and monitor progress (reflection, peer review)
- adjust their strategies

Another assessed component task determined by the instructor is the video editing assignment; which is introduced during the third week of class (the composite whole-task being introduced the first week) and presented during the sixth week of class. The purpose of this task is to equip learners with preparatory skills of managing the whole-task through a mini version of the composite skill requirement (Table 4.5). For instance, in the video editing project, learners learn to work in collaboration with a partner, acquire the basic theoretical concepts of ID, integrate relevant media technological knowledge in ID,

synthesize digital literacy into problem-solving, manage project work and work towards a short-term goal.

In planning for a component task, the instructor is careful to avoid over-simplification of the project. This task, unlike traditional associations in teaching ID through media production as an end in and of itself (Winn, 1997), does not only focus on shallow procedural processes of media production. The task again embeds the 'design within design' concept; requiring self-directed inquiry into underlying theoretical constructs for the development of an instructional video suitable for self-directed learning purposes and also requiring metacognitive analysis of self-directed learning as learners examine the principles of self-directed instructional design. This practice integrates the theory & practice of ID, placing the novice instructional designer in an apprenticeship mode of communicating, negotiating (and other related skills) to successfully approach instructional problems.

Table 4.5 Developing Tasks to Scaffold Self-Directed Learning within PoPBL

	Part-Task	**Whole-Task**
Assignment	Video editing project	R&D ID Project
Collaboration	Pair Work	Group Work (in 3's or 4's)
Learning Focus	Negotiating understanding of Skills / Knowledge	Applying Skills / Knowledge in a interrelated way
Duration	Short-term (4 weeks)	Long-term (12 weeks)
Nature of Problem	Individual solutions per instructional video	Synthesized solutions among four groups

In this design, all tasks are assessed for its learning outcomes while providing additional learning experience in self-directed learning. The concept is that assessment forms the curriculum and learners will learn what they think they will be assessed on (Ramsden, 1992). Therefore, in order to develop self-directed learners as an outcome, the learners would need to engage in learning activities that develop component skills of self-direction and these efforts need to be assessed to help learners reach their full capacity for self-determined learning.

The constructive alignment of teaching learning activities, assessment and intended learning outcomes (Biggs, 2003; Figure 4.4) is a deliberate effort to engage learners in activities that lead to deep, transformational learning and to provide feedback through well designed assessment criteria.

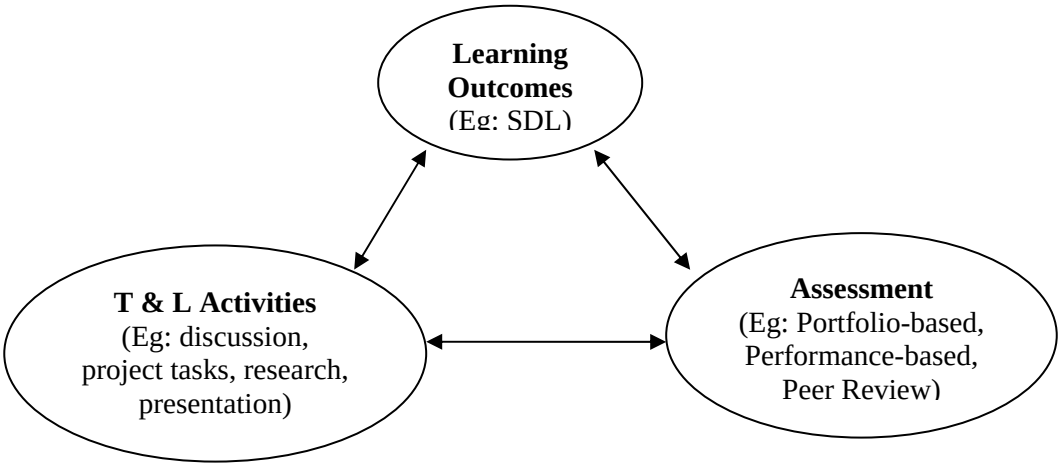


Fig 4.5 Designing Aligned T&L activities and Assessment Tasks to support SDL

Using performance-based indicators, learners' undergo continuous assessment for them to progress in the three instructor-determined tasks in the course, which are the Instructional Video assignment (15%), Shared Learning Contract (15%) and R&D ID Project (40%). These are formatively evaluated based on contextual application of learnt ID knowledge

and skills. The remaining thirty percent of assessment is fulfilled by the pre-prepared written test, which learners are able to research into the question one week before.

Learning Technologies

A number of web tools, such as *wikispaces, google docs, moodle*, that are free, online-based and having intuitive interfaces are employed intentionally. Moodle is the existing e-learning platform in the university and functions as the overall learning management system for the course. Wikispaces and Google Docs are both platforms for communication, collaborative authoring and information sharing; used to document group and individual learning progress respectively. These web technologies are introduced as mediating tools for the building and sharing of knowledge through communication of ideas, negotiation of understanding, interpretation of opinions and production of materials.

Moodle (Modular Object-Oriented Dynamic Learning Environment)

Moodle functions as the course's management system (Figure 4.5) where its '*activity modules'* such as forum, assignment, resource, survey, choice, wiki are used to support socio-constructivist interaction and inquiry between facilitator-learner, learner-learner and learner-content:

- *Forum*: Threaded discussion in the forums is used in two ways as: i) announcement forum for class news and non-course-related news ii) knowledge building forum for sharing and negotiating understandings.
- *Assignment*: Assignment rubrics are composed and uploaded for convenient reference. Learners are compelled to submit completed assignments within set deadlines or timeframes as access is restricted once deadline has passed. The instructor is able to track submission time through the automatic log report.

- *Resource*: Course content is carefully chosen to provide balance perspectives from researchers, practitioners and learners, and is posted as uploaded files, web links or texts. Initial content include introductory ID references, templates and matrixes for ID processes. Additional resources are posted as and when dictated by learner needs.
- *Survey*: The Em4En questionnaires (pre and post) are integrated into the course management system to enable learners to communicate their needs and feedback to the facilitator; enabling more effective and personalized instructional designs.
- *Choice*: This function is used to facilitate groupings for the instructional video and ID R&D project with minimal instructor intervention.
- *Wiki*: Learners were initially asked to use the wiki within moodle as a collaborating site for the R&D ID project. The fours groups used the moodle wiki for some time and decided to migrate / link to an external wiki (wikispaces) due to several editing constraints within moodle wiki.
- 

Figure 4.6 A screenshot of the course management system on *Moodle*

The activity modules are designed to engage learners in non-linear and self-directed learning experiences; through interacting and exploring new resources or activities, constructing new resources for sharing and communicating with others about their understandings. Learners' participation and engagement in respective activity modules are monitored via automatic log reports.

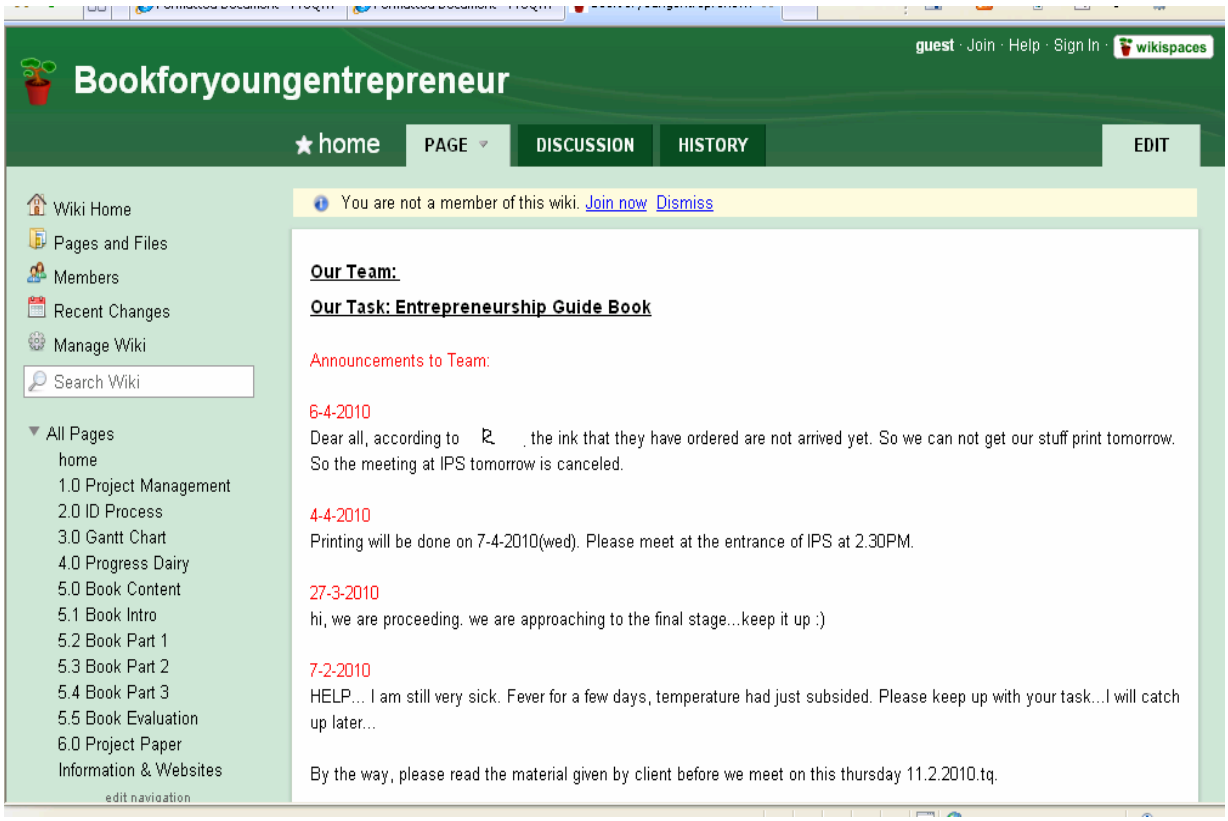
Wiki

The instructor suggested that learners use the wiki (initially moodle wiki, which three groups later chose to migrate to wikispaces and one to google sites) as a "superfast" ('WikiWiki' in Hawaiian) flexible, multi-user collaborative and content-management solution for the brainstorming and documentation of the ID project management. The wiki is used in two modes: as *documentation* and as *discussion* platform. In documentation mode, learners work on editing and adding on to structured content within the wiki while in discussion mode, learners use the wiki to communicate and interact with each other regarding project tasks.

Documentation Mode. The built-in function of wikis allows multiple users to access, update or edit and to create new information simultaneously. Additionally, changes and edits made to corresponding wiki pages can be tracked to the person that provided the change and the time changes are made. This helps the collaborators to manage new contents and the instructors in tracking in-progress self-directed work. In managing respective group ID project, learners use the wiki as a platform for collaborated authoring as they contribute to the knowledge repository of the project. The project diary (distinguished from the shared learning contract as a reflective diary) is updated to show the ID processes, project management, timelines/datelines and budgeting of each group.

Hence, learners are given a rough guideline of how to structure their wiki such as gantt chart, project management, ID process, budget. However groups ultimately work out their own structure and content as to meet the group's needs for the project (Figure 4.6).

Discussion Mode. The wiki is used asynchronously and synchronously to communicate and interact, helping the adult learners to reduce face-to-face meeting time and economize on traveling costs. Agendas related to reminders, datelines, counselling are discussed asynchronously throughout the week on specified spaces in the wikis. Additionally, the group that used Google Sites were able to meet synchronously through the embedded Google Talk; holding meetings and discussion online so they *"waste less time hopping from different platforms"*, as mentioned by learner L9. Apparently, the platforms of Google application is more intuitive, posing lower technology competence barriers to the group of learners.



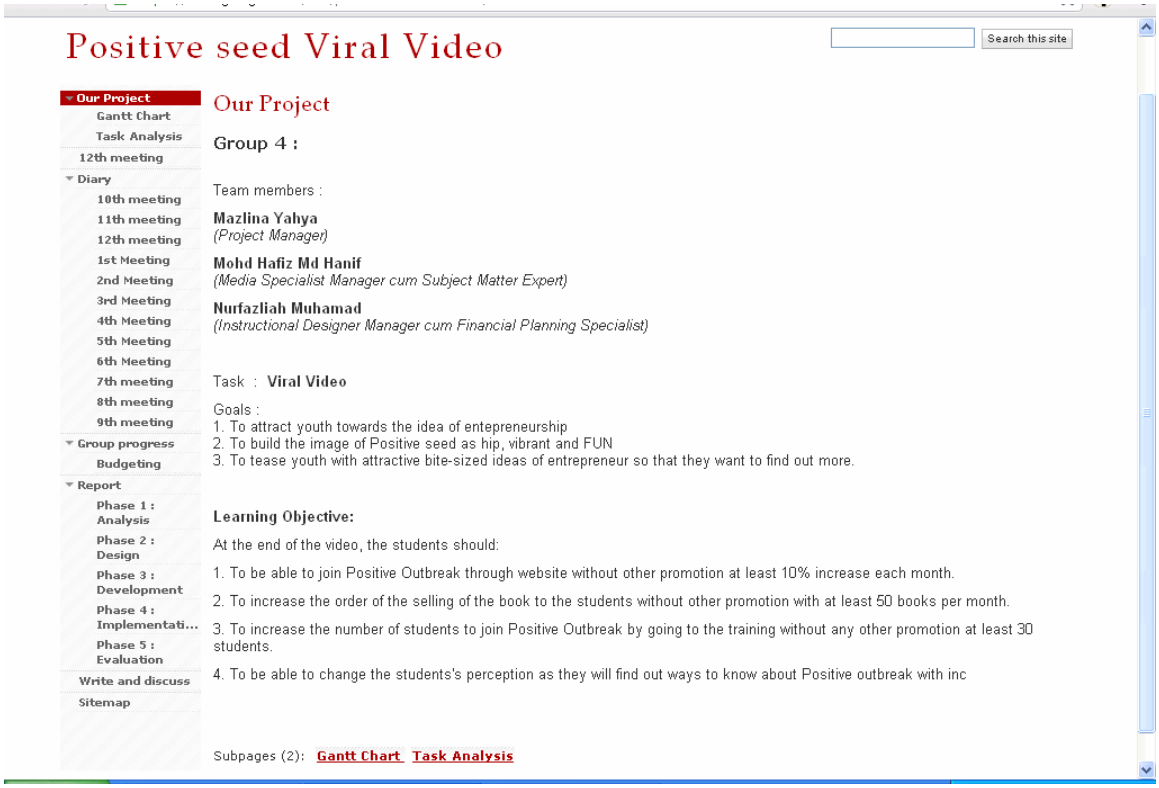


Figure 4.7 The self-directed structure of two different group wikis hosted on Wikispaces (above) and Google Sites (below)

Google Docs

Google Docs is the web platform used to host the learners' shared learning contract. At the time of research, Google Docs was deemed an easy-to-use online word processor, spreadsheet and presentation editor that could enable learners to create, store and share their learning contracts within the class learning community; hence exploiting the value of learning contracts in providing *"a sort of transitional experience between complete freedom to learn whatever is of interest…within the limits of some institutional demand or course requirement"* (Rogers, 1983:140), additionally in a collaborative manner.

Through the web platform, learners negotiate their personal learning agenda within the overall aims of course, merging the requirements of course aims to structure personalized

learning while clearly defining evidences of achievement thus providing both instructors and learners a documentation of learning progress which is formatively evaluated.

Being a shared learning contract where every modification is tracked by the learning community (Figure 4.7), learners' are anticipated to feel more accountable and responsible for their own learning. They are required to revise their learning contract and also leave comments on their peers' learning contract at least once a week; thus enabling them to conduct reflective self-assessment through benchmarking their own performance with their peers. On the other hand, the instructors are able to monitor learners' self-directed progress less conspicuously or intrusively as learners only divulge what they want to on a perceptible 'public' platform.

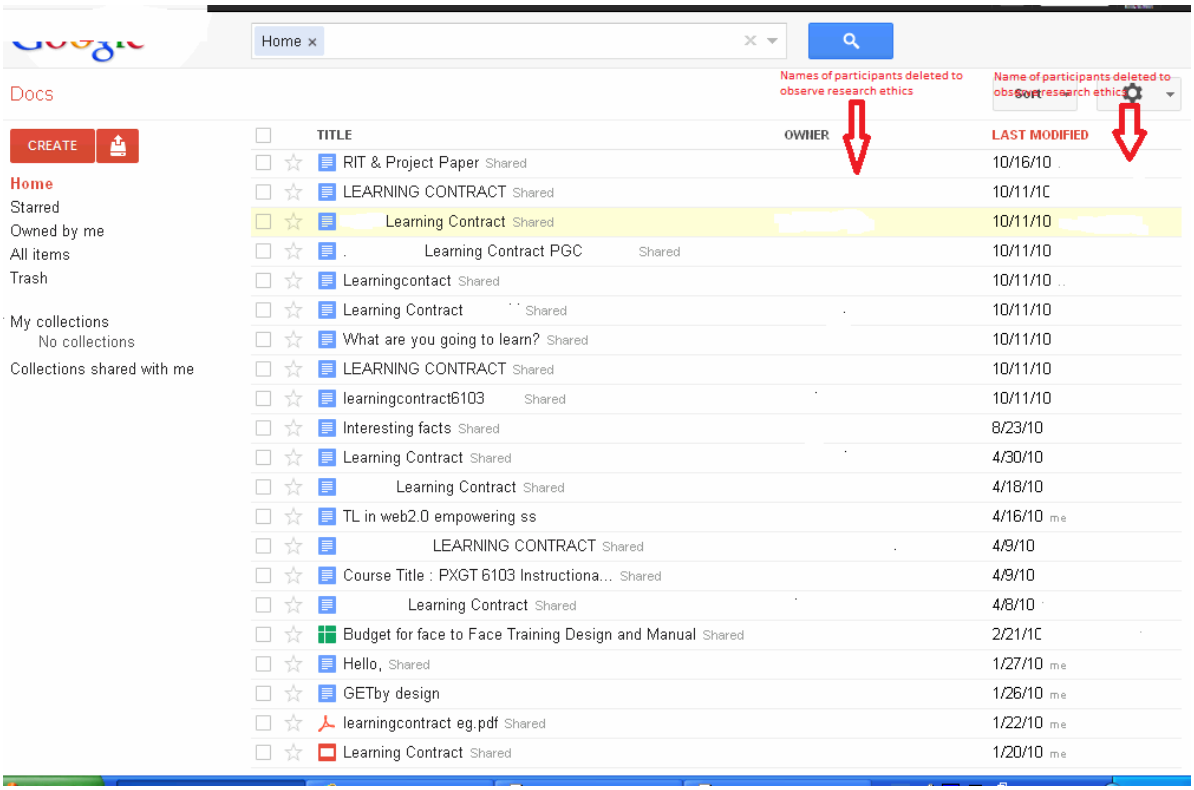


Figure 4.8 The learning contract as a shared artifact in the learning community

The shared learning contract assignment was introduced at the third week of class through a presentation of the learning contract concept and a practical session of getting acquainted with Google Docs as web tool. In the practical session, learners and instructors *create* a Google account (if not already) to access Google Docs. Next, the learners create their learning contract modified from Knowles (1986) learning contract template. The basic structure of the learning contract requires learners to state their:

- Learning objectives (in terms of knowledge, skills, attitudes or values)
- Resources and Strategies to achieve learning objectives
- Target date for the accomplishment of the specified learning objective
- Evidences to show achievement in metacognitive forms
- Verification of learning in tangible forms
- Self-reflection (including comments for others)

Learners then *share* (through entering email addresses of peers and instructors) their created document, adding them *"As collaborators"* so that those added could have access to the most recent version of the learning contract, can make comments in the learning contracts and view past versions.

The final part is to experiment working with version control. It is found out that up to 10 people can collaborate and view simultaneously and revisions made to the learning contract document are saved automatically. Learners are able to work electronically with different versions of their learning contract and able to *revert* to selected editions through a button. For

the instructors, progress of the learning contract could be monitored via the *revisions* tab; where all revisions by all collaborators are listed in order for reference re-reading (Figure 4.8).

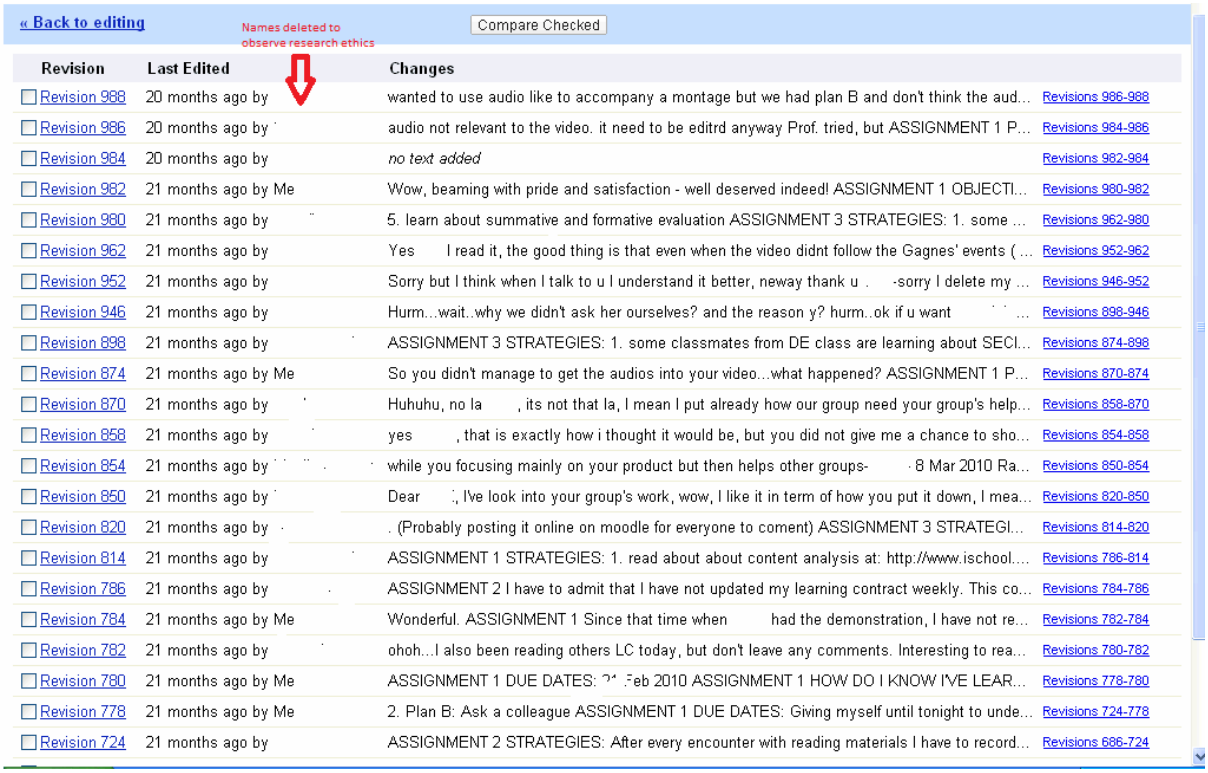


Figure 4.9 Monitoring revisions in collaboration for the shared learning contract assignment

Evaluation Phase

Evaluation within this design is both formative and summative. Constructs that are evaluated relate to the competencies of self-directed learning as observed in instructional processes and in carrying out self-directed projects (Appendix 7) whereby content knowledge is acquired as a by-product of self-directed learning.

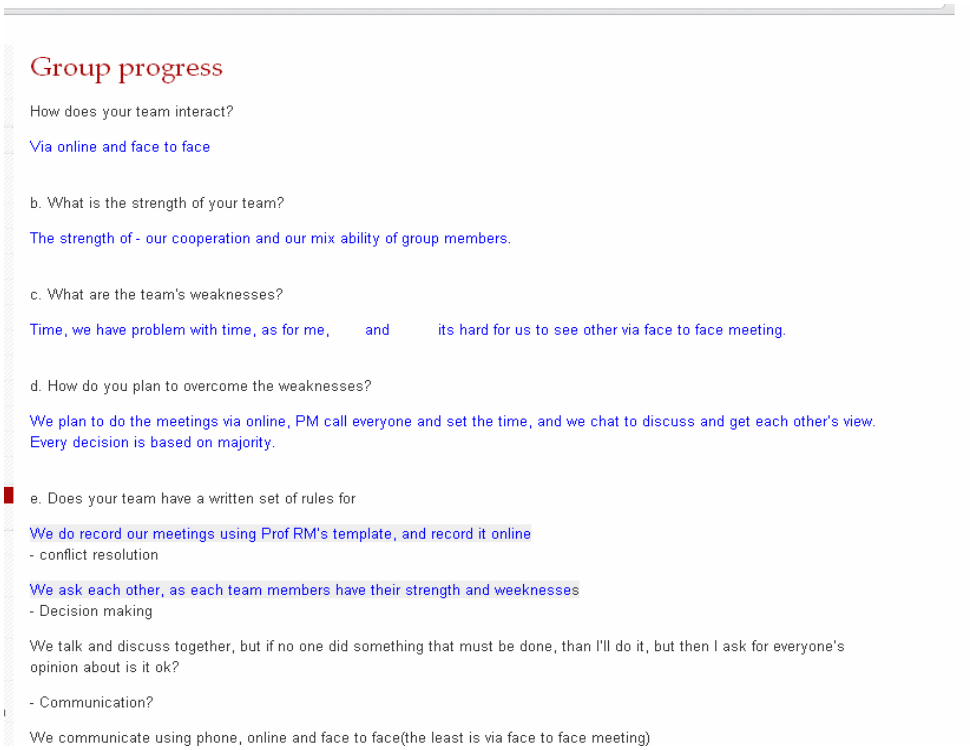
The formative procedures are *"experiments"* which looks beyond evaluation of materials to *"consider the process and the context in which learning takes place"* (Jonassen, Cernusca & Ionas, 2007:48). Hence they are iterative throughout the learning design as

phases of system refinement; taking a variety of forms including e-portfolios (shared learning contract, project diary) participation in class discussion and online forums, presentations or performances.

The summative evaluation, on the other hand comprise of debriefing, end-of-term assessment, pilot training feedback and post questionnaire, which provides data for interpretation of results. The results from the design cycles, as permitted by the constraints of this study, culminates in a *"consequences feedback loop (positive and negative, expected and unexpected)"* (Bannan-Ritland, 2003) which is hoped to yield new theoretical and applied issues, as would be discussed in the following chapters.

As this instructional design has the overall aim of developing self-directed learners, evaluation is conducted at two levels as: Top-down evaluation and Bottom-up evaluation. Top-down evaluation refers to instructor-directed forms of evaluation (indicated above); partially dictated by university rules and regulations as enshrined in the course proforma and which contributes to the learners' final course grades. These consist of participation in class forums and discussions (10 %), Continuous assessment (60%), Exam (30%). The continuous assessment component (60%) is further divided by three assignment tasks (Appendix 11, 12, 13): Instructional video (15%), Shared Learning Contract (15%) and R&D ID Project (30%). Contrary to traditional final assessments, the exam component (30%) is epitomized by two pre-prepared questions, announced to the learners a week before to allow self-directed and in-depth research into significant ID principles, models and applications.

Bottom-up evaluation consists of learner-directed forms of evaluations such as continuous learner reflections (Fig 4.9), completing the Em4En post-questionnaire or community-derived feedback on the R&D ID products (training event, e-learning platform, viral video and entrepreneur guidebook) (Fig 4.10).



Group progress

How does your team interact?

Via online and face to face

b. What is the strength of your team?

The strength of - our cooperation and our mix ability of group members.

c. What are the team's weaknesses?

Time, we have problem with time, as for me, and its hard for us to see other via face to face meeting.

d. How do you plan to overcome the weaknesses?

We plan to do the meetings via online, PM call everyone and set the time, and we chat to discuss and get each other's view. Every decision is based on majority.

e. Does your team have a written set of rules for

We do record our meetings using Prof RM's template, and record it online
- conflict resolution

We ask each other, as each team members have their strength and weeknesses
- Decision making

We talk and discuss together, but if no one did something that must be done, than I'll do it, but then I ask for everyone's opinion about is it ok?

- Communication?

We communicate using phone, online and face to face(the least is via face to face meeting)

Figure 4.10 An example of learner evaluation-reflection as feedback of learning (group) progress

	Perspectives	Responses
1	Overall Satisfaction	100%
2	Willingness to Recommend	85%
3	Willingness to Purchase	60%
4	Rating of the Book (scale1-10)	
	Scale 5	35%
	Scale 6	10%
	Scale 7	30%
	Scale 8	15%
	Scale 9	0%
	Scale10	10%
5	Most Valuable Content	
	Entrepreneur Anatomy	20%
	Business Blueprint	10%
	Self-Assessment	70%
6	Aspects to Improve	
	Content	25%
	Graphic Design	65%
	No Comment	10%
7	Other comments	
	Content	5%
	Graphic Design	35%
	No Comment	60%

Figure 4.11 An example of community-derived evaluation as feedback (guidebook)

The bottom-up evaluation, enabled by the instructional design, led the groups to internalize the norms of learning in community while designing several improved versions of the products that could be used profitably for further diffusion, adoption and adaptation in the future. The myriad of socially constructed and contextualized evaluation process is to produce educationally effective interventions (Bannan-Ritland, 2003). Evaluation is extended beyond the semester (indicating that learning is continuous and not compartmentalized) as learners attend workshops to help them plan, design and produce academic papers and poster (in teams) for presentation at a tertiary-level symposium. (Figure 4.11) (See also Appendix 22)

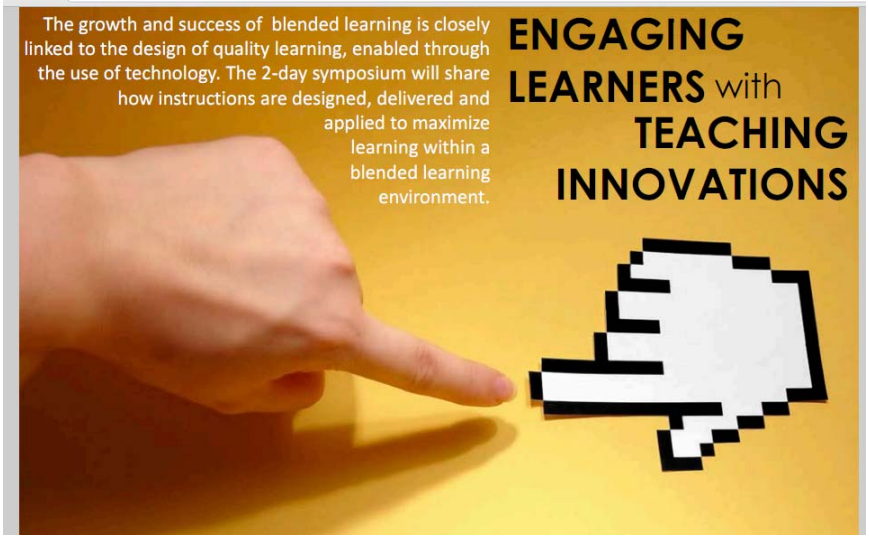


Figure 4.12 Brochure for 2-day symposium

In short, assessments of performance in the evaluation phase is continual, less formal, subjective, collaborative, cumulative, standards negotiated, embedded in authentic, tasks and problems with challenges and options. The evaluation of instructional design and learning performance is shared among the instructors, learners and community. They are also an educational experience and less of a lop-sided guessing game.

Conclusion

This chapter has presented a meta-methodological view of the processes involved in designing and developing the eSCLE to facilitate self-directed learning. The basis of the instructional design is to incorporate a “design within design” concept where the learners are able to *immerse* in a learning environment, that promotes the development of self-directed learning at the institutional level under the governance of community activity, mediating tools, rules and regulations, at the same time empowering learners to be self-direct learners out-of-class through exploration, enactment and evaluation of personal learning design. The articulation and documentation of detailed research contexts are discussed from the perspective of instructor’s and learner’s design; providing the backdrop for investigating issues related to the three research questions and serving also to inform future educational practice.

CHAPTER 5

DATA PRESENTATION AND DISCUSSION

This chapter organizes the collated data through thorough observation of behaviours, situations, interactions in the designed learning environment (discussed in Chapter 4) via methodologies (discussed in Chapter 3). These observations are analysed for patterns that can be deduced to answer the three research questions. These, bearing in mind the goal that drives the collection of data and subsequent data analysis; that is to develop a base of knowledge from the contextual perspectives of the stakeholders involved in the instructional development and learning experience of e-socioconstructivist learning environment (eSCLE) for self-directed learning (SDL).

Research Questions

1) How does the designed activity system facilitate the development of self-directed learning in an e- socioconstructivist learning environment (eSCLE)?

2) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

3) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

Results from Data Analysis

The formative and summative evaluation of learner outcomes (procedure discussed in Chapter 4) reveals the following checklists of achievements (Table 5.1) that indicate development of self-directed learning in the contexts of designed course outcomes:

Table 5.1 Checklist indicating development of Self-Directed Learning

ID Content Knowledge	**Transferable Skills**
✓ Applying ID processes to solve problems related to teaching and learning ✓ Using an ID model to design and develop an ID project ✓ Evaluating an ID project of own choice ✓ Managing an ID project in teams	✓ Collaborative / team work skills ✓ Organization skill (able to manage time, setting priorities, being systematic) ✓ Critical thinking (benchmarking others' work online) ✓ Humility ✓ Self-responsibility / ownership / accountability ✓ Helping others ✓ Digital Literacies

The Learning Environment in the eSCLE

In the course of practicing and developing self-directed learning in the designed eSCLE, the components of the activity system in its subject, object, mediating tool, community, rules and division of labour (Refer Figure 1.2) interact to feature contradictions (also known as tensions or conflicts) in the following categories:

i) option vs. obligation
ii) certainty vs. ambiguity
iii) theoretical vs. practical
iv) learner autonomy vs. teacher control
v) match vs. mismatch
vi) process vs. product

These accumulated structural tensions generated a mix of resistance and acceptance behavior within the activity system as a result of innovative attempts to change the dynamics of control (learner self-directedness) within the activity system. The voices of the subjects suggest the manner of how an eSCLE activity system should be developed to facilitate the development of self-directed learning. A balanced approach to the six contradictory constructs is suggested, as discussed below:

Option versus Obligation

Choice is welcomed in the activity system as it empowers learner self-directed learning. Learners could choose tasks that they are more comfortable with that could take away some of the fear of failure in learning self-directedly, as learner L5 reveals:

> *"i like very much because among the choices,* involves *having knowledge and skills that i have acquired prior to the class. giving us the ability to decide on our own learning really empower us, because we can decide which choice will benefit us the most. This, i think, was what empowered student-centered learning". (L5)*

The option of choosing one's own partner produces more effective group work as there is a *"positive spirit in working with people I like…the mood and ideas were flowing and things get done fast. We have more varieties of talents" (L10).*

Also, the choice of topics from the eight given titles in Assignment Task 1 (Appendix 11) provide more confidence, motivation and *"excitement"* in *"doing something that (I) am familiar with and know that that is my strength and the assurance that i can provide the best of me and my team for the client." (L9)*

However, in some cases, learners prefer to be given less of an open option to save time and energy. In the video editing assignment, L5 lamented that the choice of choosing any editing software after learning the mechanics self-directedly had them *"stayed up until midnight and it was very very stressful because we're tired".* On top of that, *"The problem is it took a lot of time searching for the right one because we have to download a few versions before we get to the functional one."(L1)*

Choice in learning is needed in equilibrium to empower self-directed learning while easing the stress of failure. The manner *choice* is administered has to be regulated, because unlimited and unrestricted could lead to 'choice overload' and may debilitate rather than liberate certain individuals.

Certainty versus Ambiguity:

The fear of the unknown is common even among adult learners and should not be taken lightly, especially due to the lack of exposure to complex real-life learning contexts among Malaysian undergraduates; who confess to be *"afraid that I cannot deliver… no experience at all in working with real clients during my undergraduate years".(L14)* It is interesting that a learner became *"cautious"* at *"the thought of applying what I've not yet learned in completing the assignment"(L2)* and in fact according to the learner, *"everyone was nervous and afraid"(L2).*

This fear and cautious behaviour is found to be more prevalent for the R&D ID Project as the *"level of uncertainty is high…do not know the procedures of working with a real client and what is expect(ed)"(L13).*

On the contrary, learners looked forward to something on their 'wanted' list; subjects that they expected to learn about in the course.

> *"I liked the instructional video editing task the most…I learnt a new skill which i had never had the opportunity to experience thet"(L6)*

> *"The task was a good force and engaged me into all these things… i just had to look for these knowledge and skills"(L11)*

Of course, sometimes, the expected is related to what is assessed in the course requirements.

> *"bcuz i needed them to fulfil the course requirements"(L3)*

In this study, the instruction was seen by the learners as having *"*minimal *structure"* (L12). As expected, levels of ambiguity are high at the introduction of a problem-based project as reflected by learner L5.

> *"i was both excited and afraid excited that for 1-2 assignments… i have the adequate knowledge to execute it… and when she said that we're going to have a real client to work with for our 3rd assignment, i was a lil bit afraid, because at that time, i do not have much understanding of what is IDD, and the thought of applying what i've not yet learned in completing the assignment, really set me to be cautious…. the level of uncertainty is high because we do not know what to expect from the client" (L5)*

Feelings of ambiguity could lead to disorientation, not knowing where and how to start on the task.

> *"we are like torn between, either to deliver and fulfil the client's wish or to fulfil our instructor's wish…where do I begin?" (L13)*

However, instruction that has tasks anchored upon what learners expect through a pre-course survey could provide appropriate scaffolds. For example, the shared learning contract helped learners to set learning goals and map out plans from the awareness of their inadequacy. It was *"needed learning"* as articulated by L10 which was helpful to help learners identify with the ambiguities by setting goals:

> *"We were made aware of the needed learning and what we have to do to finish specific task. I think without the LC, most students would be very much floating around, without having a goal set...". (L10)*

Therefore, uncertainty needs to be introduced within a framework of structure to balance the feeling of helplessness. As L8 acknowledges, *"the course designer has done a great job in seeing the probability in the uncertainty of constructive learning".*

Theoretical versus Practical

According to the instructor, the self-directed learning expected of the learners is in *"engaging with the project that requires ID knowledge and skills* therefore there was *"less of formal ID lecture"*

A self-directed ID would enable learners to see the realistic connections between tasks, so that the relevant theoretical principles are applied according to practical urgencies as learner L7 realizes.

> *"When working on the video I realized that many of the content we were reviewing was applicable to be used during training". (L7)*

According to L7, the *"learning while doing"* in the course through learning processes in various practical tasks eventually lead to the understanding of theoretical concepts.

The instructor's concept of teaching competencies in instructional design is to provide the know-hows through practical doing which leads to the self-discovery of theoretical principles:

> *"This is how you do it and this is what you need to know… so that you can justify what you do based on principles and theories and models".*

In this structure of learning, a learner (L8) reveals she was *"digging for information day-in and day-out"* which was *"exciting in our study group".* This learner represents the group of learners who see the benefits of self-directed learning through discovery and experiences, which often times is, according to L11 *"more meaningful…to see how instructional designer apply theories to do work in real-life".*

Others who require the instructor-directed theoretical input throughout learning as L13, professes:

> *"i want the instructor to keep me at the right track…help me to fill my knowledge gaps..i dont know, maybe we used to teacher center methods we always think something is missing…"(L13)*

Apparently, some cannot cope with picking up theoretical skills and knowledge self-directedly as embedded in the practical learning. Practising the competencies instructional design on top of self-directed learning skills could pose an additional load as learners may *"know what to do but* ***how*** *to do it is a big problem". (L3)*

Additionally, troubleshooting practical problems such as in the video editing task, probably can take up too much time from more 'mainstream' ID learning.

> *"really disappointed…we could do be(t)ter if didn't waste time with bad voice quality. When we editted it, it become worse.. There was no incentive to pick up ID other than the chore of video editing"(L8)*

Interestingly, some other learners are adamant that they learnt a lot both about ID principles, theories and models on top of technical aspect of video editing unconsciously, through the requirement to justify their design:

> *"Overall, I shall say that this task has really inject us with lots of knowledge about ID process and theories without us realizing it. It's like playing a game that taught us something but we didn't realize the process of learning or studying". (L2)*

The activity system of practical authentic tasks helps learners to view self-directed learning as a daily challenge, where learners show evidence of applying the practical aspects of self-directed learning in their post-course life.

For instance in making a learning contract:

> *"a few weeks ago i felt lost on my way of readings, i felt i am not moving forward anymore so i decided to make a contract with myself i used the skill that i have learned before in IDD" (L10)*

In setting up an Instructional Technology website that functions as a community of practitioners (teachers):

> *"the inspiration to build such website came from my experience during my master course at UM...to gear up teachers…teaching should be student-centered, and technology should be integrated in the T&L..".(L12)*

In using a web tool introduced in the class in own teaching context:

> *"I have been experimenting and trying out wiki as part of sharing work so that students can also learn from each other*." *(L10)*

It is clear that having learners to independently engage in the hands-on tasks help develop learners' awareness and competence for self-directed learning:

> *"i dont think i will developed self-directed learning if answers given all the time" (L2)*

The contradiction with a few learners (mostly those who underwent the traditional system of education) concerns their preference to have staged self-directed learning and confirmative feedback as represented by learner L9's statement:

> *"first must give the answers at the end then gradually the students need to be self directing and gradually dont need answers and make decision by himself or herself… i think most of us are from traditional instruction method in education system" (L9)*

These range of illustrated cases show that there are individual differences in the way learners are able to assimilate and focus on the procedural mechanics of problem-solving in practical ID. A balance of the theoretical knowledge and practical competencies would give less prepared learners better leverage to 'know how' to solve problems by consulting

their knowledge storehouse of 'know what'. In a self-directed curriculum, theoretical knowledge could still be imparted, but less through direct instruction and more through scaffolded inquired discovery.

Learner Autonomy versus Teacher Control

In any teaching and learning setting, instructors should be aware that every learner has their own expertise. Some learners, represented by learner L8, are aware of their capability and would like to be given the trust to use them to self-direct their learning.

> *"i have my own business, and photography and videography is my forte. so my knowledge on that helps me to choose the options given by the client" (L8).*

Learners were given the freedom to sought other human and non-human resources.

In friends:

> *"our friend who has kind enough to use the lab facilities, showed us the baby steps of video editing with a different application downloaded from the Internet"(L1)*

In web sources:

> *"i used youtube for tutorial…"(L6)*
>
> *"when i was looking for a good and simple video editing program.. was reading the comments in different blogs which have introduced different video editing softwares." (L14)*
>
> *"search engines which are smarter these days…google is such a good assisstant for me almost always." (L8)*

In the instructor:

> *"Please interact with me -'what have you learnt' and 'what you want to know'." The questions asked is a way for me to know if you are on the right track".* (From Moodle discussion forum)

In order to moderate the full-rein of learner autonomy, the instructor shares how *"intuition"* is needed to *"sense"* when to be the guide on the side and when to be the sage on the stage so that the learners *"are able to make sense of the ID tasks and to make meaning of the tasks that they are performing"* in their own controlled pace.

In the study, *"just-in-time"* design of instruction was practised, which the instructor likened to:

> *"Just like having a drip medication, turn the tap when needed, you can't give too much it will be bad for the body. KS (*knowledge and skills) given when needed. Or rather prescribed when needed".*

The instructor was *" co-learner…learning from them (the students)"* This liberates learners to learn self-directedly as L10 says:

> *"I learn to take initiative, responsibility and participate actively to fulfil my own learning goals". (L10)*

Correspondingly, learners can be happy to be co-teachers as an acknowledgement of their expertise and to build up transferable skills. According to learner L9:

> *"After working on these assignments and sharing with my team what I knew from before, I feel my understanding on how to design training programs and resources grew a lot more, and now I can see a bigger picture in regards to training". (L9)*

The opportunity to share and teach is a good training of presentation skills.

> *" I enjoy sharing what I know with my friends. But it suddenly become a nerve wracking experience for me coz i was sure i know it but in front suddenly i lost it...need to work on confidence" (L12)*

While most learners appreciate the shared instructional roles in the classroom, some form of scaffold or structure is still needed, for example in conveying teacher expectations:

> *think the most useful guidance was having the guidelines for the assignments. It was very much needed because we need to know to what extent the end product was expected from us..(L14)*

In short, learners need to be given autonomy together with guidance to the appropriate resources in order to balance the lack of teacher instruction in self-directed classrooms.

Match versus Mismatch:

Learners responded differently to the tasks as all three were of different nature, requiring different skills and knowledge. The shared learning contract was largely metacognitive while the instructional video and the ID project required hands-on participation. At the same time, the instructional video requires more technical knowledge of editing technologies while the ID project is *"complex and unforeseen"(L9).* Thus, learners were able to pinpoint tasks that belonged in their *"comfort zone"(L5)* or others that just *"somehow did not intrigue"(L5)* them.

The comments from different learners regarding each task show how one task cannot satisfy the preferences of every learner:

In the shared learning contract, learner L2 was enthusiastic about reflecting as *"the LC was easy".* Yet, L6 *"did not dig the LC activity.. eventhough i see the purpose of having it, i can't seemed to prioritize it…. did not intrigued me to keep on visiting it." (L6)*

Then, in the video editing task, the lack of skills could result in different responses.

> *"i kind of dislike the video editing task bec I was stuck and didn't know what to do there were a lot of constrains" (L10)*

"i liked the video editing task the most bcuz at least i learned a new skill which i had never had the apportunity to experience thet"(L3)

In the ID R&D Project, there were more issues of mismatch:

"That first meeting with the client made a big impression on us, some were shocked, some very excited, some very lost and some others so scared that finally dropped the course".(L10)

Mismatch is found in terms of skills and knowledge required (cognitive diversity):

"requires tremendous amount of analytical skills and sometimes i feel overwhelmed. Furthermore, usually, the time frame for an ID project is very short… (L6)

" without content expertise… it slow down the process tremendously and become frustrating"(L1)

Also in terms of learning style (learning style differences):

" i am kind of person who needs to be in context, to feel, tuch, and understand"(L6)

if we dont know the whole picture, how we know what can be let go and what cant (L9)

i am one person who learns through talking things out (L5)

Constraints in terms of time form a mismatch in terms of ease in adoption :

"with the timeframe given, if I did not have video editing skills, would have a very hard time"(L7)

"stressful when time is the constraint" (L6)

However, there are two sides to a coin; dealing with tasks that are out of the learners' comfort zone provides learners with skills of adaptation.

"In the positive side, I have to say that it probably made us more aware about different ways to deliver the topic". (L14)

Other than that, instructional strategies to balance the discomforts of mismatched situations could be helpful to reduce the stress. An example is where the shared learning contract allowed peers to lend a hand to provide feedback and support.

> *when i read the LC, I get to know of how my peers have proceed and advanced in their assignment. That sort of become like a benchmark/motivation for me to carry on with my own assignment.(L11)*

All in all, a balance of both matched and mismatched learning events appears to be useful to help learners engage readily in self-directed learning with the former experience, and to acquire adaptation skills which is useful in real self-directed learning situations with the latter.

Process versus Product:

In all the tasks, learners had to work together through processes of ID.

> *"for the class task, it is, i might say, virtually impossible to work alone" (L3)*

Group collaboration was meant to facilitate self-directed learning as a synchronized effort, as perceived by a learner.

> *"The division of the task between 4 groups helped to direct our efforts in different ways" (L10).*

Some had always been used to working individually, thus portraying the belief of individual learning in equation with ownership.

> *i prefer to work alone…if was doing that individually, i would done it differently…a kind of awnership" (L7)*

Thus, when placed in an ID project team, L7 had problem fitting in, complaining:

> *"it depend on the group, how do my teammate give me a space to work to give my ideas, it that group i was the youngest, at least 10 years i tried to be nice with my groupmates"(L7)*

Misfits could lead to dynsfunctional ID groups.

> *"i though it is not my role to design a book or maybe bcuz i was not a content expert" (L7)*

For L8, who describes *"this semester is the hardest phase in my life"* but sees it as a *"learning phase to improve myself",* began to reflect and adapt through the process of self-directed learning which is found to "*makes me think about how I learn".* Ultimately, L8 realizes that learning ID as in self-directed learning *"its an ongoing process"* and the evaluation system should reflect the importance of process in learning as L6 asserts:

> *"i think that points or marks should be awarded more to the process of learning". (L6)*

An instructional design for self-directed learning should allow trial and error to be part and parcel of developing ID competences. The process of regaining renewed understanding should be assessed as much as the product alone.

> *throughout the semester, I believe that we learnt a lot about instructional design, through guidance from the instructors and majorly from trial and error.(L2)*

Fumbling through self-directed search for the video content provided learners with experiences of 'means and methods'.

> *"From the content that we used to creat our video, I learnt a lot more about how we as adults learn and what the best ways to do it". (L10)*

However the developmental processes need to be guided to relieve emotional anxiety and strayed discussion, at least in the context of producing a product within a short-term.

> *"we were worried, what is right or wrong…there is a lot of things taht we discuss didnt hit the nail and sometimes even we get it all mixed up and wrong, discussion distort it a lot and make it wrong" (L5)*

With the help of web tools, the externalization of self-directed learning processes through the processes of tasks develops members of a learning community.

> *"Giving their peers access to their LC gives the opportunity for others to see other people processes in learning, and that would provide much opportunity for the students to reflect and compare themselves with others…"(L8)*

A healthy process of self-directed learning within a socio-constructivist community of learners leads to transformative learning.

> "*after that sem, I had to work on flash software. Somehow, I sort of know what to do. I did it all by myself from reading from a website about How To.." (L13)*

Hence, it is learnt that a process approach to learning (eg: how to learn, how to do something, how to solve a problem) facilitate developmental growth of self-directed learning. In promoting a process approach, trial and error and healthy collaborative experimentation are considered a worthwhile effort in developing a lifetime habit of continuous self-directed learning. A balanced emphasis on supporting self-directed learning activities and producing an end product should be in place in any activity system that aims to develop self-directed learning.

Facilitation of Web-Based Technologies in Developing Self-Directed Learning

Web-based technologies were used as mediating tools by the instructors and learners to facilitate learner self-directed learning in a collaborative manner. The evidences of self-directed learning are categorized by the actions the web tools enabled in facilitating: Investigation, metacognition, collaboration, production, interaction, articulation, evaluation and information. Following, these functions are further discussed.

Investigation Tools

Google applications such as google search, google docs, google wave were able to facilitate the self-directed quest of finding out more.

> *I became a self-directed learner by asking, searching, reading the information about the ID on the web"(L6)*
>
> *"can overcome problems if we ask (anybody), seek (anyway) and read (anything).. now we can google it" (L8)*

As learners researched into various web platforms to find the appropriate video editing tool, video explanations (eg: you tube, teacher tube) were most useful in the lack of direct instruction; being able to increase their general knowledge and understanding in the subject.

> *"We need to learn more than one video editing tools to find the one that compatible with our laptop from downloaded instructional videos. Beside that we get more knowledge in using different tools…"increased understanding of concepts". (L9)*

Furthermore, the search of information on various web platforms was an experience in terms of digital literacy.

> *"Ouh…from all the web search, I still can't solve the problem..I think am a digital immigrant? Need to learn more from *L4" (L10)*

Exploring the web sometimes results in serendipitious findings, which engages self-directed learning in one's own learning path.

> *"28 Feb: still in the mode of searching…29 Feb: I found more than what I looked for! I can't stop opening tabs of new interesting readings…Thanks *L4 for the link". (L12)*

Learners who are engaged, or in a learner's words *"into it constantly"(L7),* display self-directed learning beyond requirements of course. Appropriate web tools could extend self-directed learning beyond compartmentalized subjects; into cross-curricular overall learning.

As an example, a learner was enthusiastic to share her project paper proposal (Figure 5.1), which birthed its ideas in the present class.

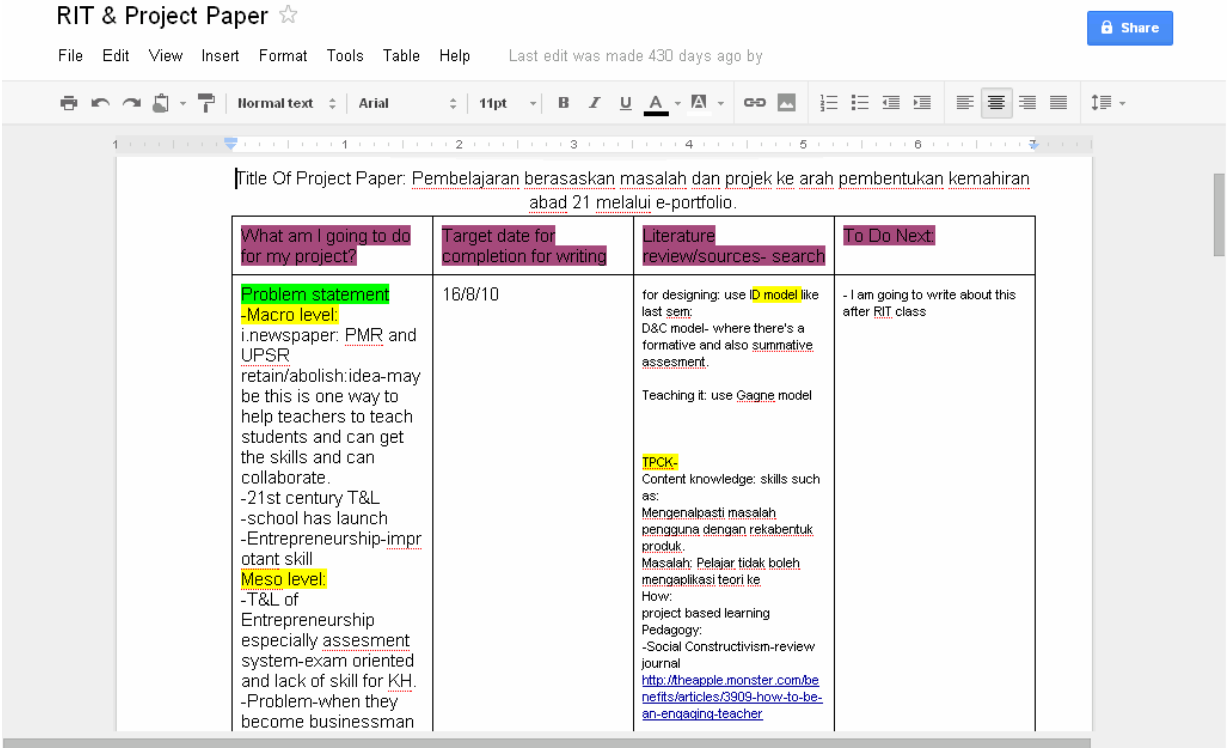


Figure 5.1 An example of the use of web tools to facilitate self-directed investigation into areas of interest

Metacognition Tools

While learners searched for knowledge via web tools, they also searched into themselves. Through the shared learning contract hosted on Google Docs (Figure 5.2), learners were able to externalize tacit information (subconscious information) that is understood in the mind but not necessarily documented.

> *"Giving their peers access to their LC gives the opportunity for others to see other people processes in learning, and that would provide much opportunity for the students to reflect and compare themselves with others…"(L8)*

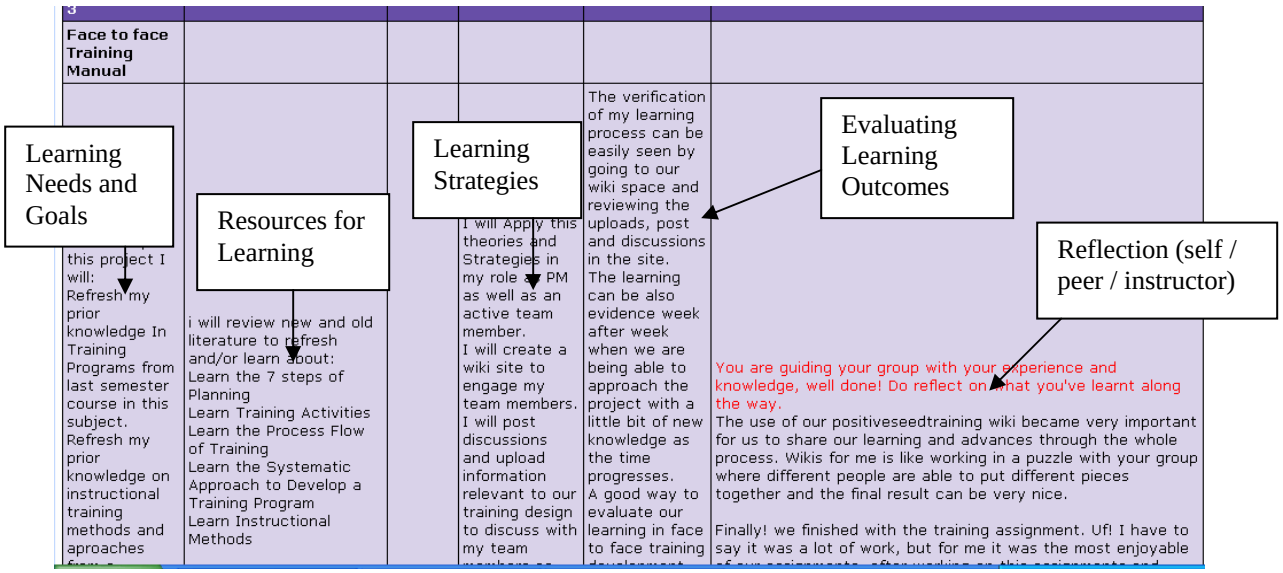


Figure 5.2 Self-directed learning at self-initiated pace (extract from a learner's shared learning contract)

The concept of open self-reflection on a web platform is reassuring for the learners as they have a sense of 'togetherness' through the difficult self-directed learning situations.

> *"I am 'glad' to read others' difficulty, it tells me the truth that everybody is on the same boat. Then it make you not to feel the fear alone". (L4)*

At the same time, metacognition could be more difficult for some than others.

> *"It seems that I couldn't be connected with my thoughts that easily.(L11)*

Multi-tasked metacognition is an added cognitive load.

> *"I realized that applying metacognition to my self while I am working in several tasks is very difficult. It took a lot from my brain to work in each part of the LC (learning contract) basically because my brain keep jumping from one project to another for this class as well as for other…" (L11)*

The particular learner explains that working in the reflexive mood breaks the momentum of thinking.

> *"Every time I needed to work on my LC I have to slow down my brain and put it in a more reflexive mood.."(L11)*

For most learners, the exercise of metacognition through a shared web platform allows them to become more aware of their capacities and capabilities.

> *"I like LC too…its like putting something that we don't know, from there we know what we don't know; its like helping ourself by doing our own strategy with friend's help". (L9)*

> *"It's like learning on our own pace, but then we can share with friends".(L14)*

Collaboration Tools

In two of the tasks, teamwork was requisite. So despite the distance, work and social constraints adult learners face, they had to find a solution to solve the perceived problem in the best way.

> *"it was team-based…had to solve problems together"(L2)*

The wiki was a team-building tool; used to bring together developing ideas from all the members for the project. Learners were able to edit, brainstorm and compare points of view on a shared document in the most fitting way.

> *"The use of our positiveseedtraining wiki became very important for us to share our learning and advances through the whole process. Wikis for me is like working in a puzzle with your group where different people are able to put different pieces together and the final result can be very nice". (L11)*

The idea of claiming ownership to the representation of negotiated beliefs and knowledge is empowering to self-directed learners.

> *"In my grouping with (L3), I learned so many new things" (L1)*

> *"No humans is perfect and thus we need each other, only then, its meaningful". (L11)*

In the preparation for the exams, the learners formed an exam discussion board on *facebook* (Figure 5.3), which they used to self-directedly recap their learning for the course, to interpret question requirements and negotiate meaning among the community of learners, thus reflecting their personal application of ID.

> *"Reading the question I think in a way she indirectly, wants us to personalize our learning, but in any T&L there must be an interaction part because communication happens not only from face to face but like this, we read, and we learn but we are at different place, I think this is more on application on how we use it".(L10)*

There is increased awareness and understanding of self-directed learning towards transformative learning as a result of collaborative negotiation.

> *"Actually indirectly I think in her mind she wants us to describe how we transform into self directed learner to equip us with thinking method...its a long term goal to help us learn".(L14)*

Figure 5.3 Facebook as a web collaboration tool for exam preparation

Interaction Tools

The web tools used supports the need for regular conversations between classes. In the lack of physical meetings, both synchronous and asynchronous interactions via web tools provide a constant support for interconnectivity.

> *"In between classes…having someone to hear my thoughts and provide suggestions can keep me thinking for a very long time. through talking things out can help me to relate to things that I read or heard before this". (L3)*

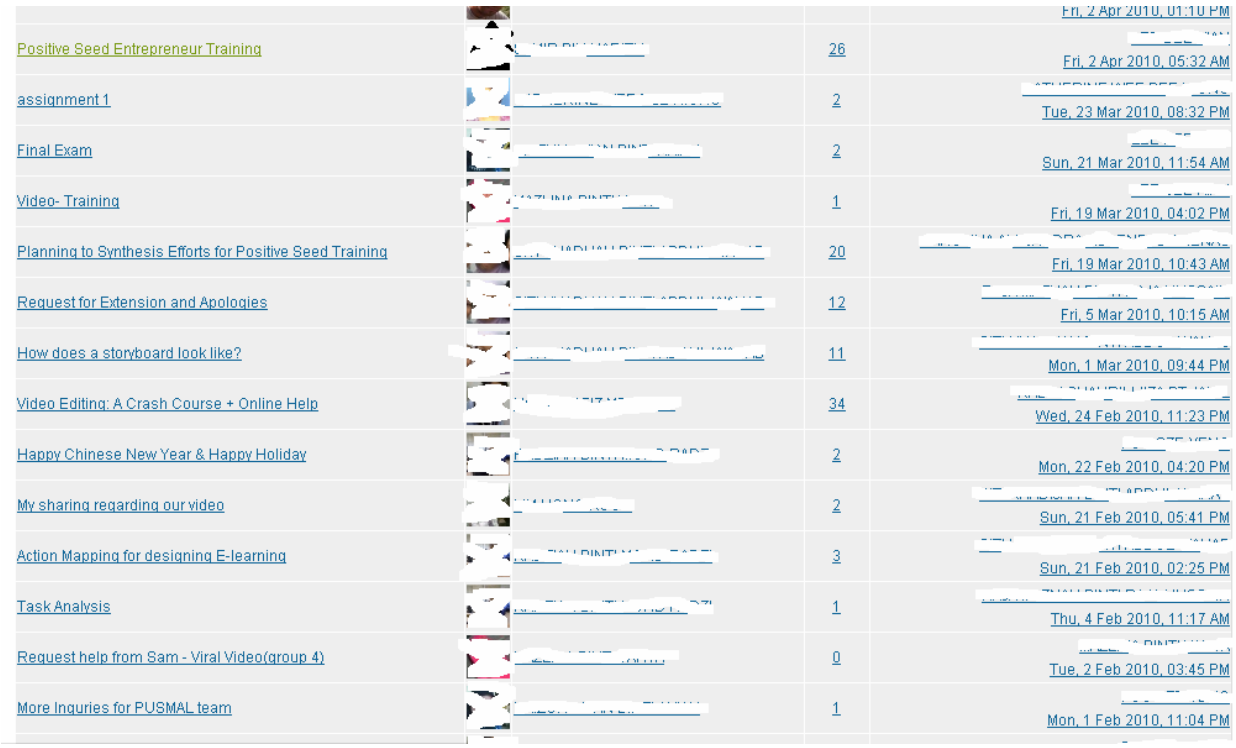
Synchronous conversations on web tools such as *Skype* provide instantaneous opportunities to connect thoughts for learning at minimal cost.

> *". If I can't wait, I might just call up *L1 for example but can't do that all the time bec it's very expensive._* I might just lost the thoughts and learning does not take place…skype was the next best choice".(L3)*

Learners also chose to interact via *google wave* as it enables spontaneous and distributed self-directed learning.

> *"I waved to *L3 a few days ago about the learning contract and learn a few tricks of using googledocs. Should not cut and paste from Words. Do straight into googledocs". (L7)*

For the instructors, asynchronous web tools such as the discussion forum on Moodle (Figure 5.4) are sufficient to enable them to keep in touch with learners' progress throughout the duration of the SLT (Figure 3.2).



			Fri, 2 Apr 2010, 01:10 PM
Positive Seed Entrepreneur Training		26	Fri, 2 Apr 2010, 05:32 AM
assignment 1		2	Tue, 23 Mar 2010, 08:32 PM
Final Exam		2	Sun, 21 Mar 2010, 11:54 AM
Video- Training		1	Fri, 19 Mar 2010, 04:02 PM
Planning to Synthesis Efforts for Positive Seed Training		20	Fri, 19 Mar 2010, 10:43 AM
Request for Extension and Apologies		12	Fri, 5 Mar 2010, 10:15 AM
How does a storyboard look like?		11	Mon, 1 Mar 2010, 09:44 PM
Video Editing: A Crash Course + Online Help		34	Wed, 24 Feb 2010, 11:23 PM
Happy Chinese New Year & Happy Holiday		2	Mon, 22 Feb 2010, 04:20 PM
My sharing regarding our video		2	Sun, 21 Feb 2010, 05:41 PM
Action Mapping for designing E-learning		3	Sun, 21 Feb 2010, 02:25 PM
Task Analysis		1	Thu, 4 Feb 2010, 11:17 AM
Request help from Sam - Viral Video(group 4)		0	Tue, 2 Feb 2010, 03:45 PM
More Inquries for PUSMAL team		1	Mon, 1 Feb 2010, 11:04 PM

Figure 5.4 Interaction on Moodle discussion forum

The shared learning contract (LC) provides an emotional pillar of support for learners in difficult times where study and personal situations are stressful. Round-the-clock support could help reduce fatigue in self-directed learning.

> *"I needed friends to be with me not just for academic purpose but like a true friend in need because life can be hard at times and we do need someone to talk to". (L11)*

The interaction on web platforms is found to provide an element of surprise or anticipation, which could advantageously promote deeper engagement in sharing.

> *"went into LC during lunch time and surprisingly found people editing my LC and others' LCs too. Hehehe…now I know when tis people sneak in and leave their tracks". (L10)*

Writing on an asynchronous web platform is appealing to those who need more thinking time.

"I have the habit of writing down thoughts or words on papers and writing them down definitely makes speaking and thinking more effective… I can think out what I wrote before I finalised it and press "enter"". (L8)

Learners believed that ideas and views are more precisely communicated through asynchronous web platforms as there is time to check for accuracy.

"I guess leaving messages behind for my friends did help to send my idea across because some of the suggestions were carried out. I guess people do take you seriously even if they do not see your face". (L5)

"I like writing asychronously because I can check for spelling, synonyms etc so that my ideas are clear and accurate". (L1)

However, it is a different case for those with language handicaps.

"it took me some time, i mean i had to spend some time to write in there in different platforms i do not about others but for me i had to use accademic words and check spelling errors". (L14)

"Writing interaction" became a load to these groups of learners.

"…and you know most of people dont like writing even in our language". (L14)

"Sorry, because I use mix language in my LC. I am not very good in English, and sometimes I cannot find suitable words to put up".(L6)

This is in comparison to those who have a preference for writing.

"I didn't find writing my thoughts as a "load". I mean it's just like speaking, just that my fingers are moving". (L1)

In actuality, the choice of web tools depends on situation. For learners not separated by physical distance, the use of asynchronous web tools loses its purposes and is paled in comparison with face-to-face conversations; as in the case of L13 who works in the same organization with the project manager:

> *"Go to use f2f (face to face) in school with our project manager and can ask question straight forward and get the feedback immediately." (L13)*

Also, specific web tools may have limitations, for instance in terms of immediacy.

> *"LC is asynchronous discussion. We were working on it in real time and we need immediate troubleshooting".*

Articulation Tools

The shared learning contract (LC) provides a platform for articulation of plans, knowledge, views and opinions. Being a shared virtual platform, learners are accountable to the community for their articulated personal strategies. This impels learners to achieve set goals within the targeted timeframe, thus is useful to manage self-directed learning.

> *"It also like a alarm keep remind me something that i'm not completed". (L3)*

The web platform also enables the construction of external representation or tacit knowledge by more knowledgeable peers; thus providing benchmarked modeling of knowledge to less competent learners.

> *"and if I'm not clear, I would just pop the question online. One thing I like about online is there is always someone to reply me with an aswer to my question or even part of the answer. I never have felt being ignored and I've got to thank the learning community that I'm in". (L7)*

An example of socio constructivist support within a self-directed learning community is the peer-led video-editing session initiated on *moodle* forum (Figure 5.5), which led to a consolidation face-to-face session.

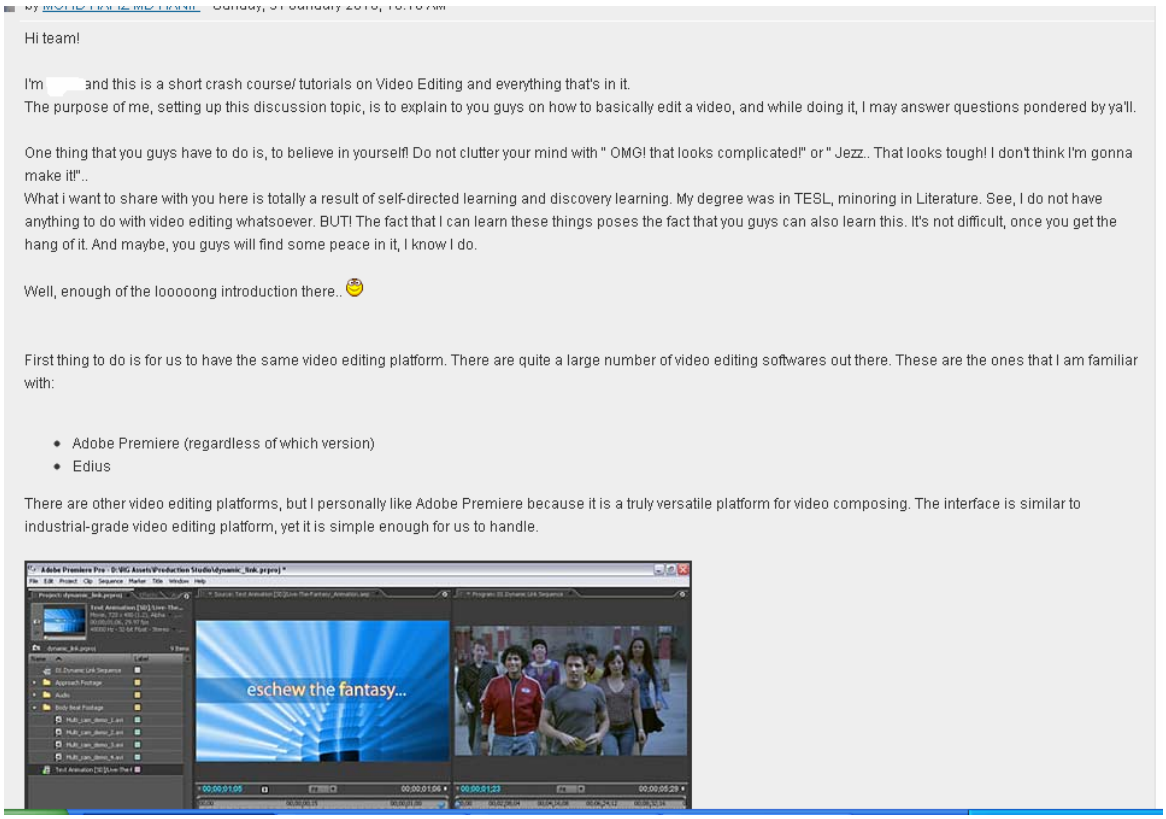


Figure 5.5 Online peer-tutoring (self-directed) on *moodle* discussion forum

Other than enabling sharing of existing knowledge, web tools also encourage learners to negotiate meaning to form new ideas; thus facilitating the accommodation and assimilation new and old knowledge structures.

> *"The discussion gave me a new understanding of storyboarding. It required me to change my old preconception of AV design". (L9)*

The articulation of sociocultural knowledge is an 'in' thing for the present generation of learners, who feel the constant need to keep in touch with the latest change.

> *"I feel like i'm in touch with the latest changes/info etc... I feel like I cannot learn as much without going on FB or moodle etc...I feel that to learn is to share". (L14)*

The act of expressing what is in the heart and mind could birth a special relationship between the 'solitary' self-directed user of the web tools and the faithful technology; consenting a conduit for articulation of thoughts and emotions:

> *"I like LC as I treat it like my friend"(L6)*

The expression of true friendship among the community of learners is needed in a laborious self-directed learning journey.

> *"I needed friends to be with me not just for academic purpose but like a true friend in need because life can be hard at times and we do need someone to talk to". (L10)*

There is less obligation to respond immediately and continually on a web platform. This enables learners who are more reserved to "enjoy" a one-way interaction in reading what others views, and through it pick up the enthusiasm to participate.

> *"I also been reading others LC today but don't leave any comments. Interesting to read theirs, I will try to join in the conversation". (L1)*

However, synchronous web tools are often preferred for its immediate effect and bigger virtual space. Web tools used in self-directed learning should be preferably non-limiting.

> *"can use other platform like google wave or buzz because sometimes it can be long and to reflect needed bigger space, google doc is like a bit limited".(L9)*

Evaluation Tools

Moodle, Googledocs and *Wikispaces* are web portfolios that the instructor used to provide 'live' and just-in-time feedback.

In the learners' shared contract, individual learners are urged to reflect on their progress in relation to the learning goals they set (Figure 5.6). The learners discovered that the more they engage in their learning contract, the more there is to reflect and learn.

> *"…asked us to reflect at least once a week according to our pace and experiences for the week.It was difficult at the beginning but the more I enter into the LC, I discover another world in there". (L5)*

What are you going to learn? (objectives; knowledge, skills, attitudes, values)	**How are you going to learn it? (resources / strategies)**	**Target date for completion**	**How are you going to know that you learned it? (evidence – metacognition)**	**How are you going to prove you learned? (Verification of learning)**	**Self-reflection**
I will learn about ID Analysis stage: - Learner analysis	I will use the Learner Analysis template provide by Prof to know what is needed to accomplish the learner analysis phase in ID. I will work with my groupmates on the questions needed to profile our target user in the eSharing project.	6 february 2010	I will be able to prepare questions to ask the target users/learner in order to profile the learner to do learners' analysis. I will be able to analyse the target learner and profile them appropriately.	I along with my groupmates will be able to produce a learner's profile questionnaire to be given to our prospective audience for the e-Sharing project. I along with my groupmates will be able to profile the target learner and identify appropriate ID strategies design ourproject.	**update on March 11, 2010** I think this part of analysis has been abandoned. Our group learned that only 2 people answer our questionnaire. Haha! and now that we are concentrating on the pilot training, this matter has been halted. Perhaps, during the pilot training we can learn more about the targeted learners.
Instructor's Comment: *Mo has a point. They have done up a pretty good one using google. Think the idea to tap into the available target learners of the f2f pilot training is good – synchronizing effort to work towards the ILO of yr client while saving time. -foo- **Peer's Comment:** Ooo…ok, my idea for you would be why don't u do an online questionnaire? It can save u ur cost, save the trees, go green…hehehe…since ur doin e-sharing, why not use what u hav? Its juz an idea.. – *Mo Hehehe..*Re, we have the same problem too, not many people answer the questionnaire, even its online, wonder why …maybe before doing it, we should test it, and do a pilot test, we forget also, to test the validity of the questionnaire itself, hurm…yup…in this case an observation, interview is better right…our group also did that…					

Figure 5.6 24/7 'Live' feedback (extracted from a learner's shared learning contract) *pseudonym in place of real name

Google Docs which is used to host the shared LC inculcates a culture of accountability and self-responsibility in learning self-directedly as feedback is regulated by the entire learning community.

> *"Each piece of feedback is linked to information on the criteria needed to do better".(Instructor)*

Similarly, live feedback documented on *Wikispaces* gave the team the flexibility to discuss and revise content in situ based on composite opinion.

> *"We looked through all the feedback and there were things that were changed from the planning. But the change was for the better". (L9)*

As learners consider another's point of view, they traverse through layers of understanding through multiple reflection and feedback, transforming perspectives for self-directed learning.

> *"Eventually I was able to make more connections here and there but I have to recognize that I need to improve on my metacognition. The good thing is that now I am more aware of one of my weaknesses so it is easy to find new approaches to make improvements in this area". (L11*)

Information Tools

Web tools were used in two ways by the learners: as consumers and contributors.

As consumers, the following web tools are used as self-directed learning resources, where learners check out postings from others which are relevant to their learning needs:

> *"I will read the five articles on* ***Moodle*** *by this week"(L4)*
>
> *"watching video tutorials on* ***youtube****…and then i practiced… skills like how a video editor works how to put sounds on video or sub titles"(L8)*
>
> *"when i was looking for a good and simple video editing program.. was reading the comments in different* ***blogs*** *which have introduced different video editing softwares(L1)*

*"**search engines** which are smarter these days…google is such a good assisstant for me almost always". (L13)*

As contributors, learners create a knowledge repository for self and others in the learning community after consuming relevant information sources. For instance, learner L1 created a personal wiki at own initiative to record synthesized understandings from reading, and which L1 re-examines as reflection throughout the semester.

*"I even note down some of my readings in my **wiki** (personal)".(L1)* (Figure 5.7)

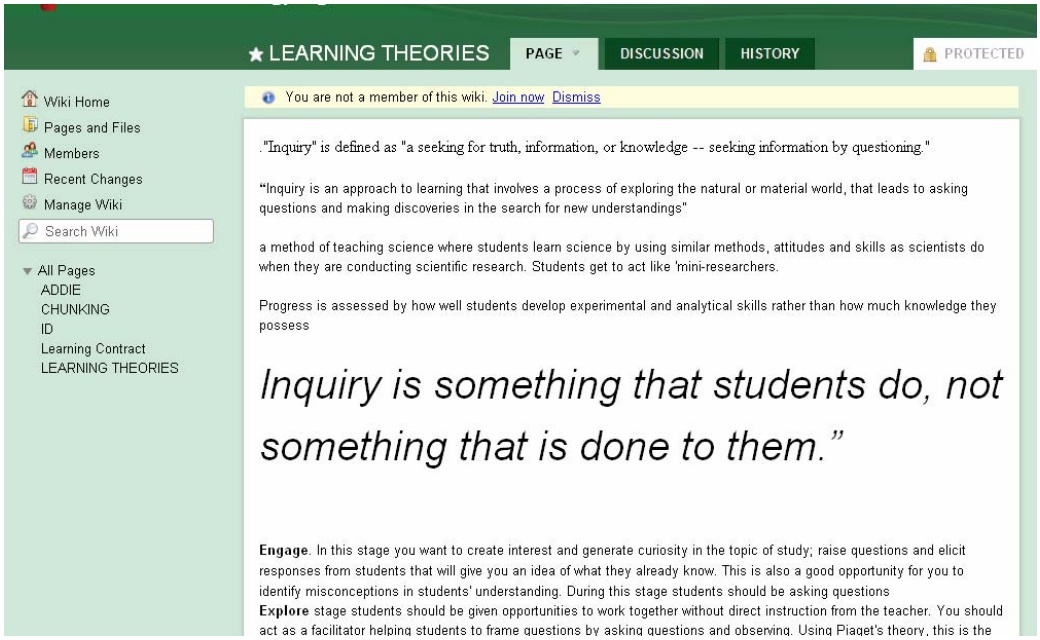


Figure 5.7 An example of a learner's Personal Learning Environment (PLE) on wikispaces

An issue regarding instructor-posted resources is that learners show little initiative to read on their own or read when reminded. Some read but cannot understand.

"I find already the resources. Its in front of my eye, in the first page of moodle." (L6)

"about the "materials", is that, yea prof did post some articles. some of us didnt read it. some of us read it and cant relate it to the class". (L9)

However, when forced to find resources through the learning contract task, they oblige.

> *"There is so much to read…no time…but I (have) been push to learn a lot of instructional design, tool, software some even are unfamiliar for me, such as video editing, use gantt Chat, microsoft publisher, word converter etc.." (L2).*
>
> *to be very resourceful by asking experts (like how to write for journal)(L4)*
>
> *I maintain my community of practice and kept on posting info on ID to them. (L8)*
>
> *we went on with the practice of discussing online with other subjects(L11)*

To summarize the findings of Research Question 2, Table 5.2 categorizes various web technologies used in the eSCLE that facilitated self-directed learning.

Table 5.2 The functional roles of web tools in facilitating self-directed learning

Self-Directed Actions enabled by Web Tools in the eSCLE	Instructor-determined web tools			Learner-determined web tools			
	Moodle	Wikispaces	GoogleDocs	Skype	GoogleWave	Facebook	Youtube
Investigation	/		/	/	/	/	
Metacognition			/				
Collaboration		/				/	
Interaction	/		/	/	/	/	
Articulation	/		/			/	
Evaluation	/	/	/				
Information	/	/	/			/	/

The choice of web tools by instructors and learners led to the discovery that:

1) Instructors expect more evaluative function from the web tools of their choice; in order to guide learners' developmental self-directed learning.
2) Learners choose other web tools that supplement the lack of function in instructor-determined web tools.
3) Learners see the urgency of using web tools that enable synchronous communication.
4) Learners believe in visual instruction, where they rely heavily on *youtube* as an alternative instructional platform.
5) Learners need constant and holistic (emotional and academic) support in self-directed learning; which is afforded by their choice of web tool i.e. social networking site *facebook.*
6) The need to investigate and collaborate lists highly in learners' choice of web tools; as a result of the project-oriented problem-based tasks assigned in the course.
7) Social networking sites (eg: *Facebook)* has the potential to facilitate self-directed learning in a social constructivist learning environment, as evident in learners' post-course engagement in the social networking site (Figure 5.8).

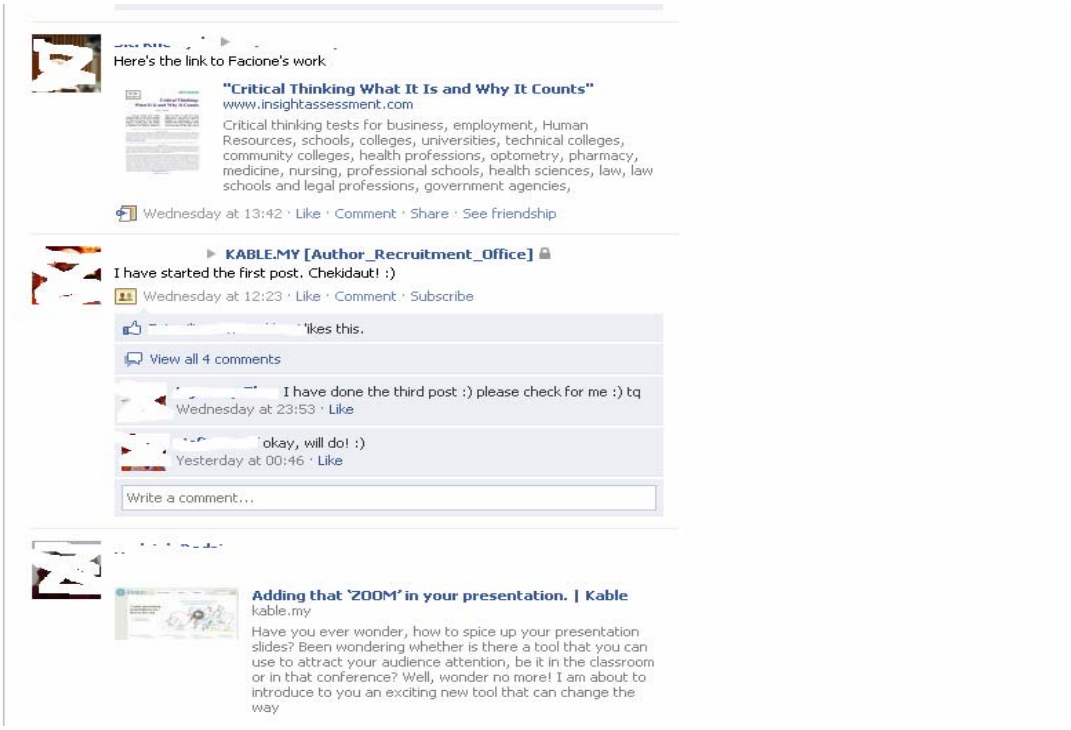


Figure 5.8 Continuous SDL among the community of learners on *Facebook*

Finally, a reflection from a learner invites more in-depth thought into the way the web tools are integrated, suggesting that the *manner* web tools are integrated into the activity system is equally important.

> *"How do a class with all the technology to support learning still feel barren when another is extremely fertile for learning that students brought the idea back home to experiment with the knowledge learnt"? (L12)*

Transitional Phases in the Development of Self-Directed Learning

While the motive of the designed instruction is to empower greater autonomy in learning with scaffolds provided for in terms of content, feedback and mentoring (with the aid of web tools), results show that there is no absolute guarantee that learners can cope with the consequences of increased ambiguity and complexity in the designed instruction for self-directed learning. Self-directed learning is a developmental construct and learners faced a steep learning curve (Figure 5.9), transitioning through five phases of *"torture"*(L8) before

seeing the light of victory. The voices of the learners illustrate the *tensions* felt in each transition phase (Table 5.3):

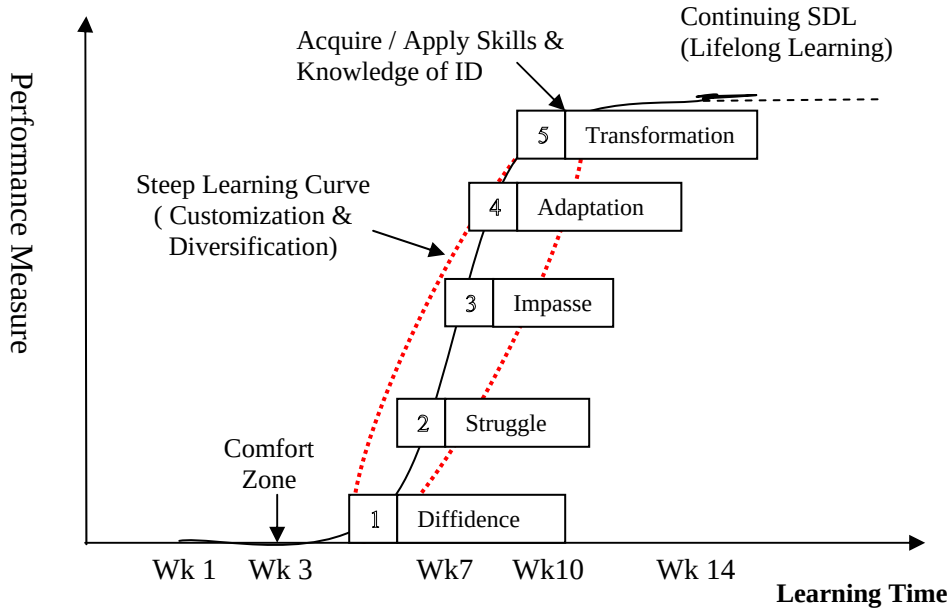


Figure 5.9 Self-Directed Learning Curve

Table 5.3 The transitional phases in SDL curve

Phase	Transitional Phases	Example of revealed tensions
1	Diffidence	*"I will always feel that I need some level of **explicit guidance** to feel that my learning experience is more enjoyable and when a teacher guide me through interactive lectures project's evaluation and in and out of class discussions I feel I can accomplish a lot more than just by myself."*
2	Struggle	*"I'm **trying very hard** to…gain something with own effort".*
3	Impasse	*"When other groups was presenting their prior project, my group* **could *only stare and listen***".*
4	Adaptation	*"Once I realized that metacognition is not one of my strength,I've been thinking **how to make myself more connected** to this model(of learning)".*
5	Transformation	*"Sometimes, I do find it is overwhelming **but in the end** i think this is what I need to have to be an achiever in life".*

The phases of transition was indicative of a conflict of roles as perceived by the beliefs of the learner based on Em4En survey questionnaire, which resulted in different actions to adjust to the eSCLE.

The proposed learning environment to empower capacity and capability is seen as a 'controlled-ill-structured' environment where learners working on solving problems in authentic situations experience 'discomfort', through the five phases in SDL learning curve (Figure 5.9 and Table 5.3). Nonetheless, as learning capacity and capability is stretched, learning in the 'discomfort zone' would be remembered as 'birthing pains' which produces great joy through new discovery of self potential.

Then, how much scaffold is required to improve capacity and capability for self-directed learning? The issue of differences (Table 5.4) affects how much scaffold or support is needed for learners to delightfully engage in the freedom of will, choice, actions, learning and development. Findings from data analysis show differences in the way learners scale the learning curve (Figure 5.9) due to situational and individual differences.

Table 5.4 Differences in coping with SDL learning curve

Situational Differences	**Individual Differences**
Level of expertise	Tolerance for ambiguity
Familiarity with subject (skill & knowledge)	Personality
Time factor (influenced by work, family, health, courseload)	Learning style
Lack of self-regulatory skills	
Language proficiency	
Culture differences	

Self-directed learning is not just the 'maturity' shown in terms of ability or competence; the attitude of the learner determines whether they are *willing* and *eager* to engage in the processes of self-directed learning. Self-directed learning competences (Appendix 7) is found to be context and content-specific; thus resulting in situational differences in adapting and coping with self-directed learning (Table 5.4).

While it was not in the objective of this research to study predictive variables for self-directed learning, it appears from learners' reflection that *motivation* is an important mediating variable that is capable of influencing their participation in self-directed learning project. During the 4th week when learners started to show signs of 'distress' (as they were slowly deposed from their comfort zone), the learners were asked to reflect on their learning orientation, whether they are between *transforming, performing, conforming or resistant* learners (Martinez, 2001; Appendix 19) and what they hope to become at the end of the course. The pep talk and interaction in Moodle discussion forum (Fig 5.4) alerted several inactive learners as it is said to *"open my eyes to my efforts"* (L2). This shows that understanding of self learning capacity and capability has been negotiated within the socio-cultural learning contexts. This group of learners, as a result, started to show interest in participation. On the other hand, there are a couple of students who reacted by rebelling against the system. This minority of learners became *resistant* and questioned the objectives of the course as they *"still can't see what I have learnt"* (L1). Some remain unaware of what it is to be self-directed and whether they have engaged in self-directed learning as interpreted from the following interview dialogue:

> ***L6****: in video editing I can say I was a self directed learner, but about the task I cant say so, becuz I couldnt realize what am I learning. I was just engaged in a project*

> ***R**: Anyway, isn't being 'engaged' a sign of self directed learning taking place?*
>
> ***L6**: no no…I said I was a self directed learner in video editing, in the pusmal project i was not informed of my learning*
>
> ***R**: Perhaps that's how you were required to learn self directedly*
>
> ***L6:** I'm not sure.*
> *(R = researcher; L6 = Learner)*

The questions that arise are whether *"informed learner control"* is crucial to increase effectiveness and efficiency in instruction as asserted by Reigeluth & Stein (1983:362)? How effective are instructions like this, where learning conditions are designed to provide opportunities and experiences of self-directed learning? At least, the case of L6 is found to be an outlier situation. Self-directed learning was task-specific because in the specific task *"actually i did not find it relevant with my learning needs…it was alittle bit complicated"*. Also the group dynamics showed that L6 could not enjoy in-depth discussion with the group due to socio-cultural-linguistic barriers.

> *"some times they were talking mandarin among themselves so i couldn't hang up all the discussion but they always informed me of the summary of discussin"(L6)*

Other socio-cultural issues manifest in some learners' lack of initiative to comment on others performance in other's learning contract because it is seen as *'intrusive' or 'impolite'* (L8); especially among peers with less rapport. However compared to peer review for the instructional video assignment, which is conducted in a face-to-face situation, learners tend to show more involvement in discussing controversial issues, taking risks to give constructive criticism on others' work (however limited to those with closer relationship) and defending differing ideas on virtual platforms.

The phases of transition lead to transformation of perspective; in ownership and responsibility for learning as characterized by self-directed learners. It is discovered that the instructor has a role to provide psychological support so that learners like L12 could develop from someone with unconscious self-directed learning incompetence to one with unconscious self-directed learning competence (Figure 5.10), in which L12 would focus not on things he already knows but on developing his capacity to learn more. Learner's unconscious incompetence could be detected through mindsets such as L12:

> *"maybe because the assignments assigned to me largely revolved around things that i know…So i just used the LC to state things that i did not know, and things that i want to achieve, which at that time, wasn't a lot. I assume, unlike me, my teammates would have goals like 'learning how to shoot videos', 'learning how to set up cameras', 'learning how to edit videos'... etc which for me, i didn't have to undergo such learning, because of my preconceived knowledge" (L12)*

Conscious Competence Learning Matrix	Competence	Incompetence
Conscious	↓ 3. We Know We Know	← 2. We Know We Don't Know
Unconscious	↓ 4. We Don't Know We Know	↑ 1. We Don't Know We Don't Know

Figure 5.10 Conscious competence Learning Matrix (www.mftrou.com)

The phases of transition involve tensions and contradictions learners experience in the context of the activity system. Those who are able to perceive conscious incompetence and

work towards conscious or inconscious competence would be inculcated with the skills of life-long self-directed learning.

Conditions that Facilitate Self-Directed Learning in the eSCLE

Having uncovered the processes of developing self-directed learning through designed activity systems, mediating web technology and phases of transition, several conditions that facilitate self-directed learning, as observed in the eSCLE are:

i) Concerted effort to work on a task continuously *"in and out of the classroom… working seriously"(L12)* and with full dedication and commitment. Positive thinking and self-motivation helps propel self-directed learning from formal to informal learning situations.

> *"That's right, my group is facing a chaotic work table. We don't have all the theories but yet have to work based on ID models and principles. But, I'm motivating myself to think positive…perhaps things just hasn't fallen in place yet". (L3)*

ii) Appropriate web tools extend collaborative independent learning, providing valuable 'serendipitious' learning experiences that transcend the formalities of the course. Through this, learners encounter "… *a really good experience…more than a usual course"(L6)*

iii) The balance of instructor-learner control empower collective choice. Learners, especially 'digital native' learners should be able to negotiate their preference of web tools, which could lead to better productivity as in the case of this study where learners negotiate to use other wiki applications such as *wikispaces* and *google sites*.

"Moodle wiki is old fashion, giving us recurrent problems in layout, fonts, embedding graphics, external linking…very disorganized. Fortunately, we could choose other wiki applications." (L12)

iv)In an eSCLE, multi-modal interaction and collaboration facilitates self-directed inquiry into new knowledge grounds. Dynamic web tools that provide participatory input provide looped feedback for deeper learning. In this study, interaction and collaboration happens in three modes: learner-content, learner-learner and learner-facilitator.

Mode of Interaction	Learner Activity
Learner-Content	Learners interact with content shared in the virtual learning spaces (Moodle, Wiki, Googledocs)
Learner-Learner	Learners collaborate with peers through discussions, reflections, projects.
Learner-Facilitator	Learners interact with facilitator through mentoring and questioning sessions. Iterative feedback from mutual discussion helps to solve teaching and learning problems.

v) Web tools need to be selected appropriately as different tools afford different collaboration mode for different types of media. Some enable learners to work on a task at the same time or work in parallel on different parts. The channel of feedback, coordination and sharing should be taken into consideration.

"When we were not working with the technical stuff, the LC and wave helps a lot, especially with the project. Moodle is good for discussing academic views". (L7)

vi) The instructor's presence is needed according to 'immediacy' of help; to model ('demonstrate to learner how and why to perform necessary activities/actions to complete a task'), to coach (intervening at critical junctures with instruction, encouragement, feedback etc) and to scaffold (giving help at learners' level of understanding).

Conclusion

This chapter has resolved to answer the study's three research questions, leading to findings that show how the designed instruction within an activity system support the development of self-directed learning (RQ1), how introduced web technology tools mediate the shift in pedagogical practice (towards more learner-control and SDL) within the contexts of the innovated activity system (RQ2) and how the systemic tensions experienced within the activity system could be resolved through phases of transition leading to transformed self-directed learning (RQ3). Further discussion on the findings shall be presented in the subsequent concluding chapter.

CHAPTER 6

CONCLUDING DISCUSSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter encapsulates the main issues that concern the design and development of the eSCLE for self-directed learning; where readers could form their interpretations or generalization to other contexts. In this chapter also, findings (from the previous chapter) are interpreted to explore its significance in the context of current literature while addressing issues of concern which functions as critical assessment of this study. Further on, pertinent issues at the conceptual and implementation level are discussed as theoretical and practical implications to provide ideas for more in-depth examination. Similarly, in acknowledging the limitations in conducting this study, further research is recommended to advance the line of investigation for future work.

Research Questions

1) How does the designed activity system facilitate the development of self-directed learning in an e- socioconstructivist learning environment (eSCLE)?

2) How does the integration of web-based technologies facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

3) How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

Summary of Findings

In answering the set out research questions above, the findings of this study conclude that the activity system designed to facilitate self-directed learning represents a complex paradigm shift from individual as agent of development to the interplay between individual, social and mediating tool as agent of development self-directed learning (Refer to Figure 1.2). The division of labour between the parties introduced conflicting sentiments of uptake where learners show ambivalence in accepting varying degrees of choice in learning (option vs obligation), in addressing tasks of ill-structured nature (certainty vs ambiguity), in adapting to learning *while* doing and not prior to doing (theoretical vs practical), in sharing responsibilities in a self-directed classroom (learner autonomy vs teacher control), in coping with non-preferable tasks (match vs mismatch) and in viewing self-directed learning and the learning of ID as a collaborative and developmental effort (process vs product).

Optimal learning conditions in an eSCLE that facilitate the development of self-directed learning in the mediated activity system are characterized by a balance of instructor-learner control in: choice of learning path, relevance of learning content, structure in learning design, assured success in learning tasks, matched teaching-learning styles in instruction and progression in assessment for learning. The climate of the learning environment, which refers to the affective dimension, is an important accompanying condition to mellow the 'harsher' environment of ill-structured problem-based learning in the eSCLE into a more conducive environment for engaged involvement in self-directed learning. Finally, learner attitude is significant in determining the authenticity in self-directed learning; whether for critical lifelong self-directed learning or merely for technical fulfillment of course requirements.

It is also discovered that appropriate web technology integrated into interactive environments are useful tools to facilitate self-directed learning; through learning activities involving the inquiry of information through investigation, metacognition, collaboration, production, interaction, articulation and evaluation. The actions of inquiring, reflecting, investigating, collaborating, interacting, articulating, producing and evaluating should be iterative (with embedded feedback loops) in order to engage learners in meaningful self-directed learning. Web technologies integrated in the eSCLE create and transform the learning experiences mediated by the activity sytem (tools and resources) into culturally acceptable attitudes, skills and knowledge.

The findings also highlight the effect of integrating *appropriate* web tools as a joint effort (being determined by both instructor and learners) in empowering learner capability and capacity for self-directed learning beyond the confines of the instructional system; which when practised as continuous engagement in acquiring, applying and creating knowledge and skills in learners' unique contexts, lead to habitual self-directed learning as lifelong learning. Web tools used as combination of asynchronous and synchronous technology promote multi-modal interaction (eg: learn-content, learner-teacher, learner-learner) and have unprecedented power to scaffold self-directed learning, even within short-term formal learning situations. In any case, the integrated web tools are not a replacement of the instructors' human presence of modeling, scaffolding and coaching. The web tools simply afford an additional mediating tool, providing a dimension of 'omnipresence' that transcends the physical constraints of instruction.

In this study, self-directed learning is perceived to be a developmental skill, and developed within socio-cultural contexts featuring acclimatization requirements of real-world learning.

In line with a process-oriented approach to learning, the designed eSCLE help learners transition through phases of self-directed learning (diffidence-struggle-impasse-adaptation-transformation), albeit in a steep learning curve. In facilitating growth and change of behavior related to the development of self-directed learning, it is contended that the instructor has the obligation and not prerogative to empower learner voice and choice, so that learners could seek out their preferred learning needs, to address any mismatch or deficiencies in the designed learning experience within their personalized learning environment. This is to provide for what is to be termed as 'constructive acclimatization' in the activity system, so that over time learners gradually learn to be self-directed in a *critical* rather than just *technical* way. Critical and technical interpretation of self-directed learning is differentiated (Smith, 2002); with the former leaning towards lifelong self-directed learning, encompassing the continuous exercise of authentic control over all learning decisions while the latter concerns the access and choice from a range of available and appropriate resources.

In accordance with socioconstructivist principles, individual learning and development is dependent on the institutions, settings and cultural artifacts in one's social milieu (Bonk & Cunningham, 1998). The design for a control-balanced web-integrated module has to be developed in view of learners' background knowledge and learning beliefs (determined through pre-survey questionnaires and ongoing monitoring in the course) so that individual learners experience in-depth enculturation into being an instructional designer through being a member of the ID learning community.

In light of the issues highlighted from the design, practitioners could take various steps to ensure success of the practical aspects of implementing self-directed learning in an eSCLE.

Some issues that concern would be brought into further discussion with the synthesis of referenced literature.

Practical Implications

This study has taken a learner-centred approach of design to develop self-directed learning through situated learning contexts for social distribution of thinking. As expected, changes in classroom roles led to some resistance, as many adult learners, especially of the older generation, prefer *"direction in their learning process for reasons of efficiency, reliance on instructor expertise or familiarity with traditional instructor-student roles"* (Schuttenberg and Tracy, 1987:4); which was also indicated by the pre-entry Em4En questionnaire survey (Appendix 10).

In such situations, instructors could learn from other studies' indicators of transitory period behavior (eg: nonsense on discussion boards – Williams, 2002) as learners acclimatize themselves to new activity systems and decide how best to handle them in specific contexts. In reforming the *directive* role, instructors should be equipped with organizational, leadership and design skills to help learners, especially at initial stages, transit into the new frame of mind and new frame of action. On a case-by-case basis, the extent of adopting the 'diminishing control model' (eg: Voeten, 2001) versus 'direct practice model' (eg: Kirschner, Sweller & Clark, 2006) in facilitating self-directed learning (as discussed in Chapter 2) should be assessed. In any way, there is no absolute surrender of instructional control to the learners as instructors would still need to focus on strengthening interpersonal mentoring relationship to cater for individual needs, known as the 'attendant affective dimension' of learning (Cohen, 1971). The mediation of

appropriate technology tools could facilitate a rich *"instructional conversation"* (Gallimore & Tharp, 1990:196) as a support of self-directed learning in the absence of direct instruction.

Techniques of apprenticeship such as those suggested by Collins, Brown and Newman (1989) could be adapted to scaffold self-directed learning in the context of training novice Instructional Designers toward expert performance (Refer to Statement of Problem in Chapter 1 for the background). For example:

(a) *modeling* to illustrate performance standard and verbalize invisible techniques,

(b) *coaching* to observes and supervise students, thereby guiding them towards expert performance,

(c) *scaffolding and fading* to support what learners cannot yet do and gradually removing that support as competence is displayed,

(d) *questioning* to request a verbal response from learners while supporting them with mental functions they cannot produce alone

(e) encouraging student *articulation* of their reasoning and problem-solving processes,

(f) pushing student *exploration* and application of their problem-solving skills,

(g) fostering student *reflection* and self-awareness (e.g. through performance replays)

(h) providing *cognitive task structuring* by explaining and organizing the task within students' Zone of Proximal Developments (refer to Chapter 2 'Self Development Within Socio-Constructivist Theory')

(i) *managing instruction* with performance feedback and positive reinforcement

(j) using *direct instruction* to provide clarity, needed content or missing information.

It is paramount for learners to reciprocate the facilitative role of the instructor, where the proposition is for the experience of the empowerment for engagement (Em4En) in self-directed learning through four steps (Figure 6.1). Learners, taking the centre stage in learning (like performers) are to genuinely explore, experiment, evaluate and enjoy the empowerment of learner control in the context of a problem-oriented collaborative setting. While learners' cannot be forced to be self-directed learners overnight, the instructors could orientate learners into two roles as learners-designer and learners-performer, by designing activities that require them to be engaged in authentic designing activities and performance-based presentations or discussions. However, this study shows that novice instructional designers, with their limited knowledge of the specific problem domain, may encounter deadlock situations and experience the opposite of 'enjoyment'. Thus, there needs to be some *dialogue* structure, within the community of learners, to help the novice designers *benchmark* and *reflect* on their own skills and performance against the norms of the ID community so the novices are aware of their insufficiency and are able to change their 'mental framework' which sets apart between novice and expert instructional designers (Rowland, 1992). In this, novice instructional designers need to be cognizant of the need to activate their 'expert' mental framework; which is to connect prior knowledge and experiences, to make inferences beyond the given information and to generate alternative solutions (Rowland, 1992). The scaffolds from mediating technology and human resources in the eSCLE are found to be a viable 'Zone of Proximal Development' to support the iterative development of self-directed learning in the field of instructional design. The mental processes afforded by the eSCLE activity system in problem-solving, discussing (dialogue), experiencing, benchmarking and reflecting (Figure 6.1), provides a scaffolding or guiding structure, which learners could utilize independent of instructor initiative; hence developing self-directed learning.

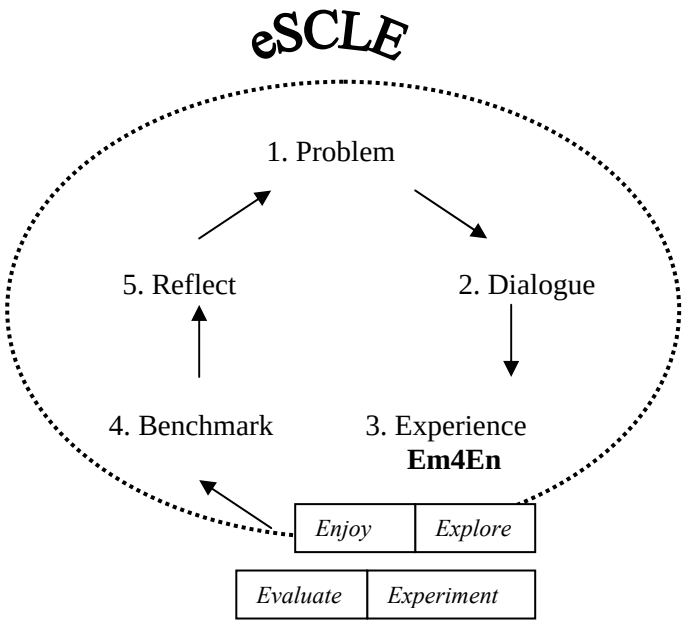


Figure 6.1 The iterative process of empowering self-directed engagement in the eSCLE

In this respect, the tension between learner autonomy versus teacher control (Addressed in Chapter 5) and correspondingly the concerns about the lack of teacher control in the classroom should be addressed with balance. Researchers like Hauske (2007:1564), for instance, are emphatic that *"didactic elements"* provide guidance, orientation, motivation and general acceptance which *"ensures"* self-directed e-learning. Understandably, uncontrolled permissiveness could result in a *laissez-faire* ID. Therefore, the contention is to balance between a didactic and *laissez-faire* ID in a way that could encourage learner self-directed learning. This decision would likely differ in respective learning contexts as the nature of instruction and the conditions of the learning environment for learner self-directed learning ought to be an outcome of negotiated interaction between the learners and instructors of a particular setting. This study proposes that the balance between a didactic and *laissez-faire* ID (an 'interactionist' ID) is able to empower learner capacity and capability for self-directed learning. Self-directed learning, being a developmental

construct, requires ‘stretching’ exercises beyond the learning comfort zones (Refer to Figure 5.9) to develop capacity and capability for lifelong self-directed learning; the former (SDL capacity) is defined as having immense passion, curiosity and determination to inquire and discover the unknown while the latter (SDL capability) is the ability to exhibit adaptability and demonstrate confidence in problem solving, given complex, unpredictable, unfamiliar or unanticipated circumstances.

In this study, instructor-specified tasks provide for pedagogical action; nonetheless the sociocultural learning conditions of individual within each collaborative community are settings for different motives and goals, resulting in various processes and outcomes from the activity system. Learners who diligently follow through the instructor-determined activities would eventually attain the motive of task-completion at the course level. However, to automatize self-directed learning at the operations level (refer Figure 1.1 in Chapter 1), personalized discussion (interaction) conducted with learners such as those based on Martinez’s (2001) categories of learning orientations (Appendix 19) in this study could help learners reflect and identify their long-term goal and strategy in learning self-directedly. This is confirmed by Biemiller & Meichenbaum (1992) and Nelson & Conner (2008) who assert that the development of a self-directed learner is more likely to occur when instructors create the understanding and awareness towards self-directed learner traits such as student motivation, goal orientation, self-efficacy, locus of control, self-regulation and metacognition, and foster them in the classroom. This is to prevent activities from remaining a ‘sequence of steps’ if learners cannot relate their action to their personal learning goals and to internalize self-directed learning as an unconscious automatized operation. Learners need to learn how to adapt their actions and beliefs to socially mediated expectations of existing communities, and to harmonize contradicting tensions

through reflection so as to experience transformation of perspective. Metacognitive regulation supported by the shared learning contract is found to help ease the phases of transition (Table 5.3) towards sustainable self-directed learning.

For the group of resistant learners, and others who also have their own preferences in learning styles and orientations, a learning environment embedded with customized and diversified instructional strategies could provide balance of structure, certainty and autonomy (Discussed in Chapter 5), to help learners pick up skills and knowledge related to the processes, theoretical and practical aspects of the subject matter. In this mindset, the learners' needs, preferences, perceptions and mental models are to be seen as dynamic, only then contributing to the dynamic process of instructional design. The first step of customizing learning environments for self-directed learning is to 'know the learners' through formative evaluation (discussed in Chapter 4) so that learning could be personalized at crucial points. With the help of web tools that function as information tools, a variety of relevant resources could be posted and shared 'just-in-time'. This *"digital buffet"* (Friedman, 2005:351) could serve the learners as and when their learning needs dictate. On the other hand, the instructor could provide learners with diversified learning experiences, allowing *"creative mismatch"* in learning preferences (Grasha, 1996) as a challenge for self-directed learning capability. The idea behind diversification is for learners of the 21st century to 'learn how to learn' in complex adaptive learning environments (refer to Chapter 1 for background). Catering for every individual in every way is a load to instructors due to the myriad of situational and individual differences among learners (Table 5.4). In addition, instructors' commitment is significantly heavier in a self-directed eSCLE, as they continually need to determine subsequent steps, appropriate

action and direction and also to provide stronger and frequent instructor support, interaction, supervision and superior organizational skills than traditional classrooms.

In an eSCLE, the learning community needs group dynamics that transcend the sole purpose of task completion. Instructors should aim to build connected communities of learners in the smaller subset of groups to facilitate lifelong self-directed learning. Besides implementing a process-oriented approach to tasks (opposed to product-oriented or final-exam approach), web tools could be integrated to form a support system for self-directed learning; where learners build knowledge networks and negotiate new found understanding through the interactive, investigative, collaborative functions afforded by web tools. As divulged in the findings in Chapter 5, a connected e-community of self-directed learners would engage in problem solving, communication, social interaction, critical thinking while honing leadership and management skills. The diversity of ideas and concepts could create learning contexts that empower learning capacity, as learners look beyond what they know to see connections between each others' ideas and concepts.

In view of the absence of physical presence in an online setting, a balance of 'cognitive, social and teaching presence' (Garrison, Anderson & Archer, 2000) would be useful as a mediating tool to help learners undergo self-directed learning under slightly complicated circumstances. The instructor's social presence as mentor and in designing for a safe interactive environment, for example could help participants identify with the learning community, thence feel safe to project their individuality by communicating purposefully. Social presence together with cognitive presence could enable learners to construct and negotiate meaning through sustained reflection and discourse. As maintained in this study, teaching presence is not obliterated; adequate and balanced levels of this is required to

coordinate the design, facilitation and direction of cognitive and social processes of learning self-directedly in a community of inquiring learners.

Theoretical Implications

This study resonates the ideology of the sociocultural, activity, and situative learning theorists (Engeström, 1987; Rogoff, 2003; Vygotsky, 1978, Lave & Wenger, 1991], where mediating tools of learning activities, technology tools and micro-interactional processes within distinct communities create authentic contexts that influence individual development in self-directed learning. However, in designing for authenticity, many practitioners may *"preauthenticate"* a design by attempting to teach what they themselves think is authentic (Petraglia, 1998). According to Petraglia (1998), there is the epistemological dilemma among educational technologists in attempting to accommodate authenticity in the design of learning environments by creating problems and environments that promote collaborative learning, apprenticeship and ill-structured contexts. While authentic situated learning is a key dimension to socio-constructivist learning environments, researchers have to take into account that real-world problems are emergent and not predefined (Jonassen, 1997). Thus, attempts to design for authenticity should engage learners themselves in problem spaces where they can make best use of the authenticity presented. Yet, as this study shows, some adult learners are not always affectively compliant with the instructor's ideals. If they do not buy into the agenda of the instruction, would the designed instruction stand in the way of developing engaged self-directed learners? The implications are real for instructors who are presented with the momentous challenge of persuading and negotiating with learners the design of authenticity as a package. The on-going process of authenticating instruction will present

the instructor with many rhetorical opportunities but no guarantees of reaping the benefits of such instructional method (Petraglia, 1997).

As ascertained through findings in this study, the introduction of authentic project-oriented problem-based learning in instruction had its fair share of unappreciated 'opportunities', where the challenges of *sensemaking in self-directed learning* (Butcher & Sumner, 2011) overwhelmed many learners' cognitive, metacognitive and attitudinal senses in learning. The loss of direction could possibly be exacerbated in cases where instructors lack the sense of intuition to moderate the amount of control versus autonomy (Chapter 5) among learners who lack domain knowledge and metacognitive skills, which are considered important skills in sensemaking activities in self-directed learning. The implication concerns the importance of metacognition to sensemaking in self-directed learning, especially in online settings where learners face the task of locating appropriate resources, evaluating the applicability and accuracy of resources, determining which portions of resources are relevant to the task at hand or integrating multiple sources of information with their own developing knowledge (Quintana, Zhang & Krajcik, 2005). The role of metacognition in regulating self-directed learning is thus reinforced in this study as defined at the outset in Chapter 1, with reference to Loyens *et al.* (2008).

Having implemented the problem-based approach and discovering a range of learner responses, this paper posits that successful sensemaking in various situations of ambiguity or certainty (Chapter 5) could be developed as a self-directed learning skill in relation to a learner's domain knowledge and his or her metacognitive capacity. It is believed that 'structured-ness' in activity tasks is influenced by the *perception* (see Figure 6.2) of the mind which then interprets the amount of cognitive load (van Merrienboer & Sweller,

2009) present in these rich learning tasks. This also helps to argue for the inherent characteristics in problem-based learning to help develop self-directed learning skills; since learners need to make conscious choices of how next to proceed in self-directed sensemaking or meaning making when faced with less straightforward problem tasks.

Table 6.1 Implementation Process for Ill-Structured Problems

Designer / Developer	Learners
Articulate Problem Domain	
Introduce Problem Constraints	
Locate, Select, and Develop Cases	
Construct Case Knowledge Base /	Articulate Goal(s)/Verify Problem
Present to Learners	Relate Problem Goals to Problem Domain
	Clarify Alternative Perspectives
	Generate Problem Solutions
Provide Knowledge Resources	Gather Evidence to Support/Reject
Support Argument Construction	Positions
	Determine Validity/Construct Arguments
	Implement and Monitor Solution
Assess Problem Solutions	Adapt Solution

This issue brings back the question of pre-authentication discussed prior to this: If the nature of structured-ness is perceived in individually differentiated way due to the mind's sensemaking, would learners be able to fully develop self-directed learning skills based on

pre-authenticated categorization of well- or ill-structured problems? Certainly, it would be premature to assume that learners engage the same skills to solve well-structured and ill-structured problems as held by early researchers like Simon (1978). With this proposition, additional dialectic or interactive instructor-learner sharing of problem space is needed to cope with the divergent paradigm of multiple alternatives. Also, in scaffolding ill-structured problem solving, instructors ought to develop cognitive flexibility among learners so that they are empowered to understand problems in their full complexity and "criss-cross" the problem space to negotiate solutions (Spiro & Jehng, 1990). Jonassen's (1997:87) framework of roles could be used as general reference to support learner self-directed problem solving skills (Table 6.1).

There are some quarters who are firm believers of flexible, positive and learner-friendly environments, which are seen as necessary to cultivate sustained interest (Saks, 2011; Barron, 2006), especially a successful 'first experience' (Saks, 2011). This research shows otherwise; that by learning to deal with the unfamiliar, adult learners, through gradual phases of transition (Figure 5.9) develop confidence in their ability to handle new information self-directedly. Sharing this notion, Fischer and Scharff (1998) maintain that the *"breakdowns"* incurred by challenging problems in the context of self-directed learning could be exploited as *"opportunities for learning"*. These views imply that complications within the eSCLE should be seen as a natural by-product of developing self-directed learning. Nonetheless, contextualized support through mediating tools should be provided as an effort to improve the motivation of self-directed learning in a challenging situation; to address findings that prove that absence of appropriate instructional support is unfavourable for learning (Mayer, 2004).

Findings from this study show that the design of a socio-constructivist learning environment employing aspects of heutatogical approaches (Refer to Table 4.4) is conducive for teaching practical subjects such as Instructional Design and to develop self-directed learning. This brings some conflict to McAuliffe's et al. (2008) claim regarding the impracticality of implementing heutagogy in a credentialing institution and the impossibility of implementing learner-guided assessment. McAuliffe's et al. (2008:4) point which concerns *"the removal of the educator",* however, shows the complexity of implementing the full course of heutagogy, perhaps more so in situations where learners have limited maturity and autonomy (refer to Figure 4.3) and readiness to accept responsibility. In actual fact, the instructor has to be prepared to relinquish full ownership of the learning path and learning process to the learners, empowering them to negotiate their own learning and determine what and how it will be learned (Hase & Kenyon, 2000). This is shown to be possible through the design elements of the eSCLE where the shared learning contract (Appendix 15), mediated by Google Docs as web tool, support learner self-direction in determining their own learning needs and goals, resources and materials for learning, learning strategies, what and how evaluation of learning outcomes is done. The consistent *"spirals of reflection"* (Canning & Callan, 2010) by learners, their peers and instructor with relation to a learner's original unit of reflection (Figure 5.2) promotes the development of 'researching into ones own practice' which engages learners in *"a continuing process of self-education"* (Schon, 1983:299), helping learners move into a growth process of transformative self-directed learning.

Having developed and evaluated the instructional design of a self-directed learning environment, the eSCLE, this study proves that formal schooling is not redundant but advocates the design of a blended learning environment (a learning environment that

combines face-to-face instruction with technology-mediated instruction; Graham & Dziuban,2008) that promote the interest and passion for sustainable and continuous self-directed learning. The idea is to diminish the gap between *in-school learning,* which Resnick (1987) once censured as lacking real-world problem contexts characteristic in *out-of-school learning,* and to design a learning environment that immerses and engages learners in simulated or authentic practice fields, in preparation for performance in communities of practice. (Barab & Duffy, 2000). Jonassen, Cernusca and Ionas's (2007) categorization of *practice fields* and *fields of practice* is useful to guide planning that replicate in-school and out-of-school activities; example of the former are simulations, project-based, inquiry-based and problem-based activities while the latter being communities of practice, apprenticeships, workplace activities.

As shown in this study, learners progressed in expertise and maturity within the set-up of "practice fields" and "fields of practice" (Jonassen, Cernusca & Ionas (2007) in the three main assignment tasks (refer to Chapter 4). Both authentic practice fields require conscious, purposive and interactive learning. Learners have to take initiative to perform or act on physical, mental or social entities; in contrast to traditional theories of "learning before acting" (Jonassen, 2002). Progression of self-directed learning in this sociocultural perspective is contradictory to the way *development* is described by cognitive and behavioristic developmental psychologists, as being hierarchical and of "invariant sequence", where *"one stage must logically follow another"* (Kasworm, 1983:33).The observation is that the development of expertise and maturity in terms of content knowledge and transferable skills (Refer Table 5.1) happened through *legitimate peripheral participation* (Lave & Wenger, 1991) within an instructional 'Student Learning Time' setting (Fig 3.2), thus endorsing the idea of legitimate peripheral participation being

applicable in school settings (which was believed to be non-germane few decades ago). The next question is whether 'un-intentionality' within a legitimate peripheral participation system (discussed in Chapter 2) is able to develop learner self-directed learning towards lifelong skill as intended (Refer to Conceptual Framework in Chapter 1)?

Within activity theory, knowledge and activity is reciprocal, hence knowledge is situated and progressively developed through activity (Brown, Collins & Dugoid, 1989). Additionally, Jonassen's (2002) reciprocal cycle of intention-action-reflection (Figure 6.2) isolates intention (or motive) as a crucial factor for meaningful learning. The 'initiative' indicative of self-directed learning (refer to Operational Definitions in Chapter 1) is evident from the statement *"articulat(ing) an intention to figure out the phenomenon…when encountering a puzzlement or problem…willfully plan to act on it and reflect on their actions in terms of their intentions"*. It is this study's contention that the development of self-directed learning could be facilitated through instructional design but is ultimately influenced by the learner's conscious choices based on willful intentions, to perceive further actions upon reflection. The basis for self-directed learning begins with the curiosity to figure out a puzzlement, to act on it and consciously reflect on constructed perception with or without the mediating tools of human and non-human resources.

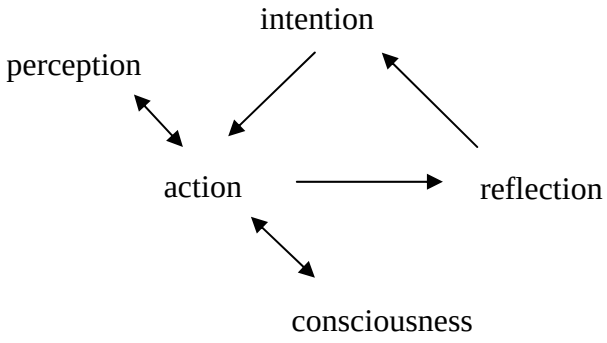


Figure 6.2 The learning cycle that facilitates SDL in meaning making

(Jonassen, 2002)

The integration of web technology tools in this study reveals the affordances of web tools to expedite the processes of self-directed learning in individual, group and community contexts. The transformation in self-directed learning competences is attributed to learners' *engagement* in tasks designed in the eSCLE activity system. This manner of development corroborates with Rogoff's (1995) idea of *participatory appropriation* where the transformation in a technology-integrated medium lends credit to how web tools promote dialogic interaction within an interdependent self-directed learning community, just as the transformation process through participation in participatory appropriation. *Participatory appropriation* is described as *"the process by which individuals transform their understandings of and responsibility for activities through their own participation"* (Rogoff, 1995). Through the appropriation of web tools, learners are able to negotiate understandings and construct knowledge through externalizing (make explicit) their internal (tacit) experiences.

The question that arose is whether the integration of web technology created opportunities for new objectives that may not be possible without them (Benson et al., 2002) or merely supplemented traditional methods of teaching? This study has shown that *agency* (in terms of allowing learners the choice of web tools (what), the how and where to learn self-directedly) enabled serendipitious learning that would not be possible in instructor-determined situations. Williams (1992) provides another perspective, arguing that choice without truthful participation is less meaningful. In retrospect, the two perspectives of agency combined would enable learners the choice to participate in the web medium of their preference and the choice to 'truthfully' engage in dialogue due to built up trust; ultimately leading to accountability in sharing experiences and knowledge.

Recommendation for Further Research

Due to the limitations and delimitations in conducting this study (discussed in Chapter 1), and also the discovery of a wealth of issues during the research process, further research from various angles of this study topic should be conducted. As an initial recommendation, specific areas by which this study can be expanded are proposed: conducting a longitudinal study, replicating the study with the researcher at different positions on the participant observer continuum, analytic approach to research into the effects of discrete variables.

A long-term study that lasts through the research students' candidature or beyond would better able examine the effects of self-directed learning in the view of lifelong learning. Prolonged engagement in a similar study would give the researcher sufficient time in the field to be immersed into the participants' learning world in the natural context sans formality. Essential relationships necessary to gain access to multiple sources (Glesne, 2005) could be attained more easily through longer engagement to the stage where sufficient rapport is built.

In this study, the role of the researcher is mainly as an observer-participant who primarily assumes the role of the person conducting the study but occasionally engage in small tasks in the field that may be goal-directed actions relevant to the object-oriented activities of interest. These experiences are said to provide *"limited first-hand knowledge of participant activities"*, in comparison to participant-observer and full participant roles (Yamagata-Lynch, 2010). Future research could see researchers taking on different roles along the participant observer continuum (Fig 6.3) after weighing the costs and benefits of each role; if need be, researchers may commit to more than one role during the entire study in order

that the ability to collect meaningful data essential to the research questions are not compromised.

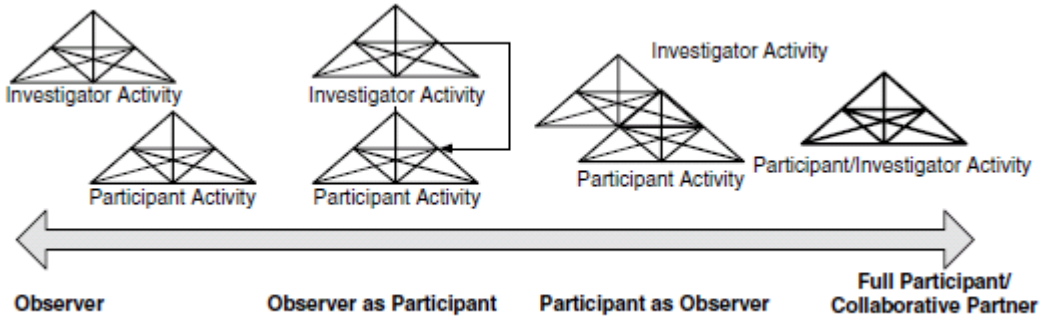


Figure 6.3 Participant observer continuum from an activity theory perspective (Yamagata-Lynch, 2010)

This research undertook the systemic approach (Salomon, 1991); involving the study of the whole instructional design system which is thought to consist of interdependent elements. This was necessary by the context and purpose of this study. However, future research may want to adopt the analytic approach (Salamon, 1991) where discrete variables can be isolated from their surroundings for in-depth study. For instance, in studying the role of scaffolds in facilitating self-directed learning, 'To what extent can peer feedback provide scaffold for the individual self-directed learner?' or 'How can web tools be integrated to develop a reflective self-directed learner?'

Conclusion

This study's investigative goal is not to make grand generalizations in the traditional sense. Instead a practical theoretical approach is employed, in establishing a fit-of-case related to the development of self-directed learning in the eSCLE, and where general findings are discussed within clearly defined learning contexts. In Stake's (1995) terms, this can be considered a *petite generalization* or *particularization* of individual cases. Specifically, this study has generated and captured some information about the design and development of the teaching and learning process, the conditions of the design in the sociocultural context for other practitioners, researchers to learn from and capitalize on.

The three research questions provided findings that discussed 1) the 'ideal' balance between learner-directed activities (tasks) and scaffolds from designed features in the course 2) the unique role of web technologies in influencing the development of self-directed learning in a socio-constructivist manner and 3) the transitioning phases of developing self-directed learning in an eSCLE.

As a result, this study shows that self-directed learning as lifelong learning actions is developed in an eSCLE through a shift in locus of control from instructor-dependent learning to interdependent learning. Interdependent learning in a blended socio-constructivist learning environment is empowered through the concept of 'community of learners' who collaborate, negotiate and support each others' proactive inquiry and self-evaluative initiatives.

Self-directed learning flourishes when it is conducted in blended physical and virtual spaces where both explicit and tacit information can be socially constructed and shared.

Developing self-directed learning in a socio-cultural context is close to real-world learning but complex for both instructors and learners, especially among subjects who lack domain expertise and the metacognitive skills. However the competences developed is able to equip learners for self-sustained, self-directed and self-determined lifelong learning throughout their professional and private lives.

The design of the eSCLE for self-directed learning is an attempt to promote *opportunities* for learning that reflects the unstructured seamless nature of lifelong self-directed learning and to empower autonomous and independent habits of seeking and retrieving information through web technology. The opportunities to empower engagement in self-directed learning are provided for through the design and development of an activity system that brings together various mediating tools, signs and systems to stimulate an *Em4En* learning experience (Figure 6.3).

However, it should be cautioned that variability in response to the design is inevitable, since the instructor cum learning experience designer can only point the way with signs and tools of the activity system, learners wield the power of choice to conceptualize and operate the actions within the socio-constructivist learning environment. As Wenger (1998) cautions:

> *"The relation of design to practice is therefore always indirect. It takes place through the ongoing definition of an enterprise by the community pursuing it. In other words, practice cannot be the result of design, but instead constitutes a response to design."*

Hence, the journey towards facilitating sustainable self-directed learning in the instructional setting begins with the mindset to think out of the box. To begin with, the physical room where regular meetings should not be viewed merely as classrooms but

learning spaces; the time to learn is not governed by authority or decree but by genuine curiosity and initiative; the course credit hours are not merely lectures but purposeful activities with self-determined goals; the course outcomes are not rules that bind but guidelines that assist. It is the hope of the researcher that both the high and low level self-directed learners have learnt, through their successful and not so successful self-directed learning experiences, to self-direct and self-regulate the processes involved in self-directed learning to eventually develop a penchant for lifelong learning (in contrast with lifelong education).

Bibliography

Albanese M.A. and Mitchell S. (1993). Problem-based learning: a review of literature on its outcomes and implementation issues. *Acad Med, 68,* 52-81.

Alfred, M. V. (2002). The promise of sociocultural theory in democratizing adult education. In M. V. Alfred (Ed.), *Learning and sociocultural contexts: Implications for adults, community, and workplace education*. San Francisco: Jossey Bass.

Ambrose, S. A., Bridges, M.W., DiPietro, M., Lovett, M. C., Norman, M. K. (2010) *How Learning Works: Seven Research-Based Principles for Smart Teaching.* San Francisco: Jossey-Bass

Bannan-Ritland, B. (2001). Teaching Instructional Design: An Action Learning Approach. *Performance Improvement Quarterly, 14*: 37–52.

Barab, S.A. & Duffy, T.M. (2000). From practice fields to communities of practice. In D.H. Jonassen & S.K. Land (Eds.). *Theoretical Foundations of Learning Environments.* Mahwah, NJ: Lawrence Erlbaum Associates.

Barab, S. A., Evans, M. A., & Baek, E.-U. (2004). Activity Theory as a lens for characterizing the participatory unit. In D. H. Jonassen (Ed.), *Handbook of Research on Educational Communication and Technololgy*. Mahwah, NJ: Lawrence Erlbaum.

Barrows, H.S. (1985). *How to Design a Problem-Based Curriculum for the Preclinical Years.* New York: Springer Publishing.

Beckman, S.L. and Barry, M. (2007). Innovation as a learning process: embedding design thinking. *California Management Review, 50*(1), 25-56.

Bednar, A. K., Cunningham, D., Duffy, T. M. & Perry, J. D. (1992). Theory into practice: How do we link? In T. M. Duffy and D. H. Jonassen (Eds.) *Constructivism and the technology of instruction: a conversation*. Hillsdale, NJ: Lawrence Erlbaum Associates, 17-35.

Beer, D., & Burrows, R. (2007). Sociology and, of and in Web 2.0: Some initial considerations. Sociological Research Online, 12(5). Retrieved from http://www.socresonline.org.uk/12/5/17.html

Benson, Denzel E., Wava Haney, Tracy E. Ore, Caroline Hodges Persell, Aileen Schulte, James Steele, Idee Winfield. (2002). Digital technologies and the scholarship of teaching and learning in sociology. *Teaching Sociology. 30,*140-157.

Berkson L. (1993). Problem-based learning: have the expectations been met? *Acad Med, 68,* 79-88.

Biemiller, A., & Meichenbaum, D. (1992). The nature and nurture of the self-directed learner. *Educational Leadership, 50*(2), 75-80.

Biggs, J. (2003). *Teaching for Quality Learning at University: What the Student Does. (2nd ed.)* Bershire: SHRE & Open University Press.

Bloor, M. and Wood, F. (2006). *Keywords in Qualitative Methods: A Vocabulary of Research Concepts.* London: Sage.

Bolhuis, S. and Voeten, M.J.M. (2004). Teachers' conceptions of student learning and own learning. *Teachers and Teaching: Theory and Practice, 10*(1).

Boettcher, J.V. (2006). The rise of student performance content. *Campus Technology,* 28 Feb. Retrieved June 20, 2010 from http://www.campustechnology/article.aspx?aid=40747

Bonk, C.J. and Cunningham, D.J. (1998). Searching for learner-centred, constructivist, and sociocultural components of collaborative educational learning tools. In Bonk, C.J. and King, K.S. (eds.) *Electronic Collaborators: Learner-Centred Technologies for Literacy, Apprenticeship, and Discourse.* Mahwah, NJ: Lawrence Erlbaum Associates.

Boud, D. & Higgs, J. (1993). Bring self-directed learning into the mainstream of tertiary education. In N. Graves (ed). *Learner Managed Learning: Practice, Theory and Policy*. HEC, Leeds: World Education Fellowship & Higher Education for Capability. 159-173

Bray, B. and McClaskey, K. (2012). *Personalization vs Differentiation vs Individualization*. Retrieved June 21, 2012 from http://barbarabray.net/2012/01/22/personalization-vs-differentiation-vs-individualization-chart/

Brockett, R. G. (2009). Moving forward: An agenda for future research on self-directed learning (pp. 37-50). In M. G. Derrick & M. K. Ponton (Eds.), *Emerging directions in self-directed learning.* Chicago: Discovery Association Publishing House

Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice.* New York: Routledge.

Brookfield S (1995) Adult learning: an overview. In A. Tuinjman (ed.) (1995). *International Encyclopedia of Education.* Oxford: Pergamon Press

Brown, B. L. (2000). *Changing career patterns* (ERIC Digest No. 219). Columbus, OH: ERIC Clearinghouse on Adult Career and Vocational Education. (ERIC Document Reproduction Service No. ED445235).

Brown, A. L., & Campione, J. C. (1994). Guided discovery in a community of learners. In K. McGilly (Ed.), *Classroom lessons: Integrating cognitive theory and classroom practice* (pp. 229–270). Cambridge, MA: MIT Press/Bradford Books.

Bruner J S (1996). *The culture of education.* Harvard University Press. Cambridge.

Candy, P. C. (1991). *Self-direction for Lifelong Learning: A Comprehensive Guide to Theory and Practice.* San Francisco: Jossey-Bass.

Canning, N. (2010). Playing with heutagogy: Exploring strategies to empower mature learners in higher education. *Journal of Further and Higher Education, 34*(1), 59-71.

Canning, N. & Callan, S. (2010). Heutagogy: Spirals of reflection to empower learners in higher education. *Reflective Practice, 11*(1), 71-82.

Carr-Chellman, A. & Duchastel, P. (2000). The ideal online course. *British Journal of Educational Technology, 31*(3), 229-241.

Chen L-L (1997) Distance delivery systems in terms of pedagogical considerations: a re-evaluation. *Educational Technology,* July/August. 34-37.

Chene, (1983) The concept of autonomy: A philosophical discussion. *Adult Education Quarterly, 34*(1), 38-47.

Chuang, P. M. (2010) Asia's tight labour market drives up pay, job turnover. *The Business Times.* Oct 13, 2010.

Collins, A., Brown, J.S. & Newman, S.E. (1989). Cognitive apprenticeship: Teaching the craft of reading, writing and mathematics. In L.B. Resnick (Ed.) *Knowing, Learning, and Instruction: Essays in honor of Robert Glaser.* Hillsdale, NJ: Lawrence Erlbaum.

Cognition and Technology Group at Vanderbilt. (1993). Anchored instruction and situated cognition revisited. *Educational Technology, 33*(3), 52-70.

Cohen, Y.A. (1971). The shaping of mens's minds: Adaptation to imperatives in culture. In M. Wax, S. Diamond, & F. Gearing (Eds.), *Anthropological perspectives on education*. New York: Basic.

Conaway, R. N., Easton, S.S. and Schmidt, W.V. (2005). Strategies for enhancing student interaction and immediacy in online courses. *Business Communication Quarterly,68*(1), 23-35.

Confessore, G. J. & Park, E. (2004). Factor validation of the Learner Autonomy Profile, version 3.0 and extraction of the short form. *International Journal of Self-directed Learning, 1* (1), 39 -58.

Convery, I. and Cox, D. (2012). A review of research ethics in internet-based research. *Practitioner Research in Higher Education, 6*(1), 50-57.

Cress, U. and Kimmerle, J. (2008). A systemic and cognitive view on collaborative knowledge building with wikis. *International Journal of Computer-Supported Collaborative Learning, 3*,105-122.

Creswell, J. W. (2007). *Research Design: Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage.

Davies, C.A., Bailey, C., Nypaver, M., Rees, T. and Brockett, R.G. (2010). Learning projects of graduate students: An update of Tough's study. *International Journal of Self-Directed Learning,7*/1, 14-28.

Denzin, N.K. (1989). *The Research Act: A Theoretical Introduction to Sociological Methods.* (3rd ed.) Englewood Cliffs: Prentice-Hall.

Des Marchais JE. (1993). A student-centred, problem-based curriculum: 5 years' experience. *Canadian Medical Association Journal, 148*:1567-72.

Désilets, A., and Paquet, S. (2005), *Wiki as a Tool for Web-based Collaborative Story Telling in Primary School: A Case Study.* National Research Institute for Information Technology Council Canada. In Proceedings EdMedia 2005 – World Conference on Educational Multimedia, Hypermedia & Telecommunications.

Dewey, J. (1916). *Democracy and Education.* The Free Press, New York.

Dias, L. B. (1999) Integrating technology. *Learning & Leading with Technology, 27*(3), 10-21

Downes, S. (2005). E-learning 2.0. *eLearn Magazine,* October. Retrieved October 26, 2011 from http://www.elearnmag.org/subpage.cfm?section=articles&article=29-1

Duffy, T. M., & Savery, J. R. (1995). Problem based learning: An instructional model and its constructivist framework. *Educational Technology, 35*, 31-38.

Engeström, Y. (1987). *Learning by Expanding: An Activity-Theoretical Approach to Developmental Research.* Helsinki: Orienta-Konsultit Oy. Retrieved June 30, 2011, from http://lchc.ucsd.edu/mca/Paper/Engestrom/expanding/toc.htm

Engeström, Y. (1999) Innovative learning in work teams: analysing cycles of knowledge creation in practice, in: Y. Engeström et al (Eds.) *Perspectives on Activity Theory,* Cambridge, Cambridge University Press, 377-406.

Ertmer,P. A. (1995). Teaching instructional design: An apprenticeship model. *Performance Improvement Quarterly, 8*(4), 43-58.

Ertmer, P. A., & Stepich, D. A. (2005). Instructional design expertise: How will we know it when we see it? *Educational Technology, 45*(6), 38-43.

Feltovich, P., Prietula, M. & Ericsson, K.A. (2006). Studies of expertise from psychological perspectives. IN K.A. Ericsson, N. Charness, P. Feltovich & R.Hoffman (Eds.), *The Cambridge Handbook of Expertise and Expert Performance, pp 41-67,* New York: Cambridge University Press.

Fishcher, G. and Scharff, E. (1998). Learning technologies in support of self-directed learning. *Journal of Interactive Media in Education, 4*(26).

Fitzgerald, C. T. (2003). *Self-directed and collaborative online learning: Learning style and performance* (Doctoral dissertation, Boston College, 2003). Dissertation Abstracts International, 64(05), 1612.

Friedman, T.L. (2005). *The World Is Flat.* New York: Farrar, Strans and Giroux.
Friere, P. (2000). Pedagogy of the oppressed. (Translated by Myra Bargman Ramos) New York: Continuum.

Gagne, R.M. and Briggs, L.J. (1979). *Principles of Instructional Design.* New York: Holt, Rinehart and Winston.

Gallimore, R. & Tharp, R. (1990). Teaching mind in society. In L. Moll (Ed.). *Vygotsky and education: Instructional implications and social applications of sociohistorical psychology.* New York: Cambridge University Press.

Garrison D.R. (1992) Critical thinking and self-directed learning in adult education: an analysis of responsibility and control issues. *Adult Education Quarterly, 42*, 136–148.

Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly, 48*(1), 18-33.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical thinking in text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, *2*(2), 87-105.

Gay, G., Rieger, R. & Bennington, T. (2001). Using mobile computing to enhance field study. In T. Koschmann, R. Hall, & N. Miyake (Eds.), *CSCL2: Carrying Forward the Conversation.* Mahwah, NJ: Lawrence Erlbaum

Ge, X., & Land S. M. (2004). A conceptual framework for scaffolding ill-structured problem solving processes using question prompts and peer interactions. *Educational Technology Research and Development, 52*(2), 5-22.

Gifford, B., & Enyedy, N. (1999). *Activity centered design: Towards a theoretical framework for CSCL.* In C. Hoadley & J. Roschelle (Eds.), Proceedings of the CSCL 1999 Conference. Mahwah, NJ: Lawrence Erlbaum. Retrieved September 17, 2011, from http://www.gseis.ucla.edu/faculty/enyedy/pubs/Gifford&Enyedy_CSCL2000.pdf

Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social Problems, 12*(4), 436-445.

Glaser, B.G. & Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research.* New York: Aldine de Gruyter.

Grabinger, S., Aplin, C. and Ponnappa-Brenner, G. (2007). Instructional design for sociocultural learning environments. *e-JIST, 10*(1).

Graham, C.R., & Dziuban, C.D. (2008). Core research and issues related to blended learning environments. In J.M. Spector, M.D. Merrill, J.J.G. Van Merrienboer, & M.P. Driscoll (Eds.). *Handbook of research on educational communications and technology* (3rd ed.). Mahwah, NJ: Lawrence Earlbaum Associates.

Grasha, A. F. (1996). *Teaching With Style.* Pittsburgh, PA: Alliance.

Greeno, J. G. (2006). Learning in activity. In R. K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences*. New York: Cambridge University Press.

Grieve, K. (2003). Supporting *learning, supporting change: A research project on self-management & self-direction.* Toronto: Ontario Literacy Coalition. Retrieved April 30, 2010 from http://www.on.literacy.ca/research/ smsdfld/smsd_fld.pdf

Guglielmino, L. M. (1977). *Development of the Self-Directed Learning Readiness Scale.* Dissertation Abstracts International, 38, 6467A.

Hadley, G. (2000). *A task-based approach to teaching English for science and technology.* Retrieved October 4, 2011 from http://www.nuis.ac.jp/~hadley/publication/kosentbl/taskbased.htm

Hamilton L. & Gregor F. (1986) Self-directed learning in a critical care nursing program. *The Journal of Continuing Education in Nursing 17*, 94–99.

Hammond M. & Collins R. (1991) *Self-Directed Learning: Critical Practice.* Kogan Page, London.

Hartley, K. and Bendixen, L.D. (2001). Educational research in the Internet age: examining the role of individual characteristics. *Educational Researcher, 30*(9), 22-26.

Hasan, H. (2003). Information systems development as a research method. *Australasian Journal of Information Systems, 11*(1), 4-12

Hauske, S. (2007). *Instructional design for self-directed e-learning – students' experiences and perceptions.* Proceedings of World Conference on E-learning in Corporate, Government, Healthcare and Higher Education. Chesapeake, VA: AACE.

Hirshon, A. (2005). A diamond in the rough: Divining the future of e-content. *EDUCAUSE Review, 40*(1), 34-44.

Huang, H.M. (2002). Toward constructivism for adult learners in online learning environments. *British Journal of Educational Technology, 33*(1), 27-37

Iwasiw C.L. (1987). The role of the teacher in self-directed learning. *Nurse Education Today* **7**, 222–227.

Jacobson, M.J. and R.J. Spiro (1995). Hypertext learning environments, cognitive flexibility, and the transfer of complex knowledge: an emperical investigation. *Journal of Educational Computing Research, 12*(4), 301-333.

Jarche, H., 2009. *Social media and self-directed learning. Social media and self-directed learning.* Available at: http://www.jarche.com/2009/11/social-media-and-self-directed-learning/ [Accessed July 4, 2011].

Jonassen, D. H. (2002). Learning as activity. *Educational Technology, 42*(2), 45–51.

Jonassen, D. (1997). Instructional design models for well-structured and ill-structured problem-solving learning outcomes. *Educational Technology, Research & Development, 45*(1), 65-94.

Jonassen, D. H. (1995). Supporting communities of learners with technology: A vision for integrating technology in learning in schools. *Educational Technology, 35*(4), 60–62

Jonassen, D. H., & Carr, C. S. (2000). Mindtools: Affording multiple knowledge representations for learning. In S. P. Lajoie (Ed.), *Computers as cognitive tools: No more walls: Theory change, paradigm shifts and their influence on the use of computers for instructional purposes.*(Volume 2). Mahwah, NJ: Lawrence Erlbaum.

Jonassen, D. H. & Rohrer-Murphy, L. (1999). Activity theory as framework for designing constructivist learning environments. *Educational Technology, Research & Development, 47*(1), 61-79.

Jonassen, D.H., & Land, S.M. (1999). *Theoretical foundation of learning environments.* Mahwah, NJ: Lawrence Erlbaum Associates.

Jonassen, D., Hernandez-Serrano, J. and Choi, Ikseon (2000). Integrating constructivism and learning technologies. In J.M. Spector and T.M. Anderson (eds.) *Integrated and Holistic Perspectives on Learning, Instruction and Technology.* Boston: Kluwer Academic Publishers.

Jonassen, D., Cernusca, D., & Ionas, G. (2007). Constructivism and instructional design: The emergence of the learning sciences and design research. In R. A. Reiser & J. V. Dempsey (Eds.), *Trends and issues in instructional design and technology* (2nd ed., pp. 45-52). Upper Saddle River, NJ: Pearson.

Kasworm, C. (1983). Self-directed learning and lifespan development. *International Journal of Lifelong Education, 2*(1), 29-46.

Kearsley G (1998) Educational technology: a critique. *Educational Technology, 38* (2) 47-51.

Kellner, D. (2000). Multiple literacies and critical pedagogies. In P.P. Trifonas, *Revolutionary Pedagogies – Cultural Politics, Instituting Education, and the Discourse of Theory.* New York: Routledge.

Kinzie, M. (1997). *Exploring Professional Practice through an Instructional Design Team Case Competition.* In Proceedings of selected R&D presentations at the National Convention of the Association for Educational Communications and Technology, Albuquerque, NM, February 14-18, 1997.

Kirschner, P.A., Sweller, J. and Clark, R.E. (2006). An analysis of the failure of constructivist, discovery, problem-based, experiential and inquiry-based teaching. *Educational Psychologist, 41*(2).

Kirsten R. Butcher & Tamara Sumner (2011). Self-directed learning and the sensemaking paradox, *Human–Computer Interaction, 26*:1-2, 123-159

Knowles, M. (1990). *The Adult Learner: A Neglected Species.* Houston, TX: Gulf Publishing.

Knowles, M. S. (1988). *The modern practice of adult education: Andragogy versus pedagogy* (Revised edition). Englewood Cliffs: Prentice Hall/Cambridge.

Knowles, M. (1986). *Using Learning Contracts.* San Francisco, CA: Jossey-Bass.

Knowles, M. S. (1975) *Self-Directed Learning. A guide for learners and teachers*, Englewood Cliffs: Prentice Hall/Cambridge.

Kuhn, D. and Pease, M. (2006). Do Children and Adults Learn Differently? *Journal of Cognition and Development, 7*(3), 279-293.

Lamb, B. (2004). Wide open spaces: Wikis, Ready or Not. *EDUCAUSE review, 39*(5), 36-48

Land, S.M. & Hannafin, M. (1996). A conceptual framework for the development of theories-in-action with open-ended learning environments. *Educational Technology: Research and Development, 44*(3), 37-53.

Lave, J. and Wenger, E. (1991). *SituatedLearning. Legitimate Peripheral Participation.* Cambridge: Cambridge University Press.

Lebow, D. (1993). Constructivist values for systems design: five principles toward a new mindset. *Educational Technology Research and Development, 41,* 4-16.

Leont'ev, A. (1972). The problem of activity in psychology. *Voprosy filosofii, 9*, 95-108.

Leuf, Bo and Ward Cunningham. (2001). *The Wiki Way: Quick Collaboration on the Web.* Upper Saddle River, NJ: Addison-Wesley Professional.

Long, H. B. (2000). Understanding self-direction in learning. In H. B. Long & Associates (Eds.), *Practice & theory in self-directed learning* (pp. 143-150). Schaumburg, IL: Motorola University Press.

Loyens, S.M.M., Magda, J. and Rikers, R.M.J.P. (2008). Self-directed learning in problem-based learning and its relationships with self-regulated learning. *Educational Psychology Review, 20*:411-427.

Martinez, M. (2001). Key design considerations for personalized learning on the web. *Educational Technology & Society, 4*(1).

Maslow, A. (1970). *Motivation and Personality* (2nd ed). New York: Harper and Row.

Maudsley G. (1999). Do we all mean the same thing by `problem-based learning?' A review of the concepts and a formulation of the ground rules. *Acad Med 74*,178-85.

Mayer, R.E. (2004). Should there by a three-strikes rule against pure discovery learning? The case for guided methods of instruction. *American Psychologist, 59*(1), 14-19.

McAuliffe, M., Hargreaves, D., Winter, A., & Chadwick, G. (2008). Does pedagogy still rule? In*Proceedings of the 2008 AAEE Conference*, December 7-10, 2008. Yeppoon, Queensland. Retrieved April 4, 2012 from: http://www.engineersmedia.com.au/journals/aaee/pdf/AJEE_15_1_McAuliffe%20F2.pdf

McLoughlin, C. and Lee, M.J.W. (2010). Personalised and self-regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology, 26*(1), 28-43.

Merriam, S.B. and Caffarella, R.S. (1999). *Learning in Adulthood: A Comprehensive Guide* (2nd ed). San Francisco: Jossey-Bass

Merriam, S. B., Caffarella, R. S., & Baumgartner (Eds.). (2007). *Learning in adulthood: A comprehensive guide* (3rd ed.). San Francisco: John Wiley & Sons.

Merrill, D. (2007). A task-centred instructional strategy. *Journal of Research on Technology in Education, 40*(1), 33-50.

Mocker, D. W., & Spear, G. E. (1982). *Lifelong learning: Formal, nonformal, informal, and self-directed.* Columbus, OH: ERIC Clearinghouse for Adult, Career, and Vocational Education, Ohio State University.

Moore, M. (2006). *Self-directed learning and distance education.* Retrieved August 14, 2011 from http://cade.athabascau.ca/vol1.1/moore.html

Mwanza, D. (2002a). Conceptualizing work activity for CAL systems design. *Journal of Computer Assisted Learning, 18*(1), 84–92.

Moore, M.G. (2007). The Theory of Transactional Distance. In M.G.Moore (Ed.) (2007) *The Handbook of Distance Education*. Second Edition. Mahwah, N.J. Lawrence Erlbaum Associates. pp. 89–108

Nardi, B, A. (1996). Studying context: A comparison of activity theory, situated action models, and distributed cognition. In B.A Nardi (Ed.), *Context and consciousness: Activity theory and human-computer interaction.* Cambridge, MA: MIT Press.

Nelson, S., & Conner, C. (2008). *Developing self-directed learners.* Retrieved January 15, 2011 from http://www.nwrel.org/planning/reports/self-direct/self.pdf.

Oddi, L. F. (1985). Development and validation of an instrument to identify self-directed continuing learners. *Adult Education Quarterly, 36,* 97-107.

Ozuah, P. O., Curtis, J. and Stein,R.E.K. (2001). Impact of problem-based learning on residents' self-directed learning. *Arch Pediatric Adolescent Medical, 155*

Pandian, A. and Aniswal, A.G. (2005). *University Curriculum: An Evaluation on Preparing Graduates for Employment,* Monograph 5/2005. In Morshidi Sirat (series editor). Universiti Sains Malaysia: National Higher Education Research Institute, Penang

Paavola, S. and Hakkarainen, K. (2004). The knowledge creation metaphor – An emergent epistemological approach to learning. *Science & Education, 14*, 535-557.

Peat, J., Mellis, C., Williams, K. and Xuan W. (2002), *Health Science Research: A Handbook of Quantitative Methods,* London: Sage.

Perry, William G., Jr. (1981). Cognitive and ethical growth: The making of meaning". In Arthur W. Chickering and Associates, *The Modern American College*. San Francisco: Jossey-Bass, 76-116.

Petraglia, J. (1998). The real world on a short leach: the (mis)application of constructivism to the design of educational technology. *Educational Technology Research and Development, 46*(3), 53-65.

Proulx, Jean, (2004). *Project Based Learning.* Sante-Foy: Presses de l'Université du Québec.

Resnick, L. B. (1987). Learning in school and out. *Educational Researcher, 16,* 13-20

Rowland, G. (1992). What do instructional designers actually do? An initial investigation of expert practice. *Performance Improvement Quarterly, 5*(2), 65-86

Quinn, J. (1994). Connecting education and practice in an instructional design graduate program. *Educational Technology Research and Development, 41*(1), 79-91.

Quintana, C., Zhang, M., & Krajcik, J. (2005). A framework for supporting metacognitive aspects of online inquiry through software-based scaffolding. *Educational Psychologist, 40*, 235–244

Raidal, S. & Volet, S.E. (2009). Preclinical students' predispositions towards social forms of instruction and self-directed learning: A challenge for the development of autonomous and collaborative learners. *Higher Education, 57*(5), 577-596.

Ramsden, P. (1992). *Learning to Teach in Higher Education.* London: Routledge

Reigeluth, C.M. (1999). What is instructional-design theory and how is it changing? In C.M. Reigeluth (Ed.), *Instructional-Design Theories and Models: A New Paradigm of Instructional Theory. (Volume II).* Hillsdale, NJ: Lawrence Erlbaum Assoc.

Reigeluth, C. M. & Stein, F.S. (1983). The elaboration theory of instruction. In C.M. Reigeluth, ed. *Instructional-design theories and models*, 335-82. Hillsdale, NJ: Erlbaum.

Reiser, R.A. (2001).A History of Instructional Design and Technology: Part II: A History of Instructional Design, *Educational Technology Research and Development, 49*(2), 57–67

Richey, R.C. (2000). The future role of Robert M. Gagne in instructional design. In R.C. Richey (Ed.), *The Legacy of Robert M. Gagne.* NY: Syracuse University.

Richey, R.C. and Klein, J.D. (2007). *Design and Development Research Methods, Strategies and Issues.* Mahwah, New Jersey: Lawrence Erlbaum Associates.

Roblyer, M.D. (2006). *Integrating educational technology into teaching* (4th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Rogers, C. R. (1983). *Freedom to Learn for the 80's*. Ohio: Charles E. Merrill Publishing.

Rogers, C.R. (1961) *On Becoming a Person. A therapist's view of psychotherapy*. Boston: Houghton Mifflin

Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J. V. Wertsch, P. Del Rio, & A. Alvarez (Eds.), *Sociocultural studies of mind*. New York: Cambridge University Press.

Rourke, L., Garrison, R., Anderson, T., and Archer, W. (2000). *Assessing Teaching Presence in a Computer Conference Environment.* University of Calgary.

Saks, K. (2011). *Development of self-directed learning skills with web 2.0 tools.* Paper presented at International Coonference "ICT for Language Learning". Retrieved 20 December, 2011 from http://www.pixel-online.net/ICT4LL2011/common/download/Paper_pdf/SLA26-180-FP-Saks-ICT4LL2011.pdf

Salomon, G. (1991). From theory to practice: the international science classroom — a technology-intensive, exploratory, team-based and interdisciplinary high school project. *Educational Technology, 31* (3), 41-44.

Salomon, G., & Perkins, D. N. (1996). Learning in wonderland: What do computers really offer education? In S. Kerr (Ed.), *Technology and the future of education. 1996 Yearbook of the NSSE.* Chicago: University of Chicago Press.

Scardamalia, M. and Bereiter, C. (1996). Adaptation and understanding. In S. Vosniadou, E. DeCorte, R. Glaser & H. Mandl (Eds.). *International Perspectives on the Design of Technology-Supported Learning Environments.* Mahwah, NJ: Lawrence Erlbaum Associates.

Schön, D.A. (1983). *The reflective practitioner: How professionals think in action*. United States: Basic Books, Inc.

Schunk, D.H. (2004). *Learning theories: An educational perspective (4th ed.).* Upper Saddle River, NJ: Merril & Prentice Hall.

Schuttenberg, E. M., and Tracy, S. J. (1987). The role of the adult educator in fostering self-directed learning, *Lifelong Learning: An Omnibus of Practice and Research*, *10* (5), 4-6.

Shapley, P. (2000). On-line education to develop complex reasoning skills in organic chemistry. *Journal of Asynchronous Learning Networks, 4*(2). Retrived May 18, 2010 from http://www.sloan-c.org/publications/jaln/v4n2/index.asp1.

Simons, P.R. (2000). Towards a constructivistic theory of self-directed learning. In G.A. Straka (eds.) *Conceptions of Self-Directed Learning.* Waxmann, 155-169.

Simon, D. P. (1978). Information processing theory of human problem solving. In D. Estes (Ed.) *Handbook of Learning and Cognitive Process.* Hillsdale, NJ: Lawrence-Erlbaum.

Skehan, P. (1996). Second language acquisition research and task-based instruction. In J. Willis and D. Willis (eds.) *Challenge and Change in Language Teaching.* Oxford: Heinemann English Language Teaching.

Smith, M. K. (2002). Malcolm Knowles, informal adult education, self-direction and andragogy. *The encyclopedia of informal education*. Retrieved June 12, 2012 from www.infed.org/thinkers/et-knowl.htm.

Spencer, J. A. and Jordan, R.K. (1999). Learner centred approaches in medical education. *BMJ, 318*, p1280-1283.

Spiro, R., & Jehng, J-C. (1990). Cognitive flexibility and hypertext: Theory and technology for the nonlinear and multidimensional traversal of complex subject matter. In D. Nix & R. Spiro (Eds.), *Cognition, education, and multimedia* (pp. 163-202). Hillsdale NJ: Lawrence Erlbaum Associates.

Stake, R. E. (1995). *The Art of Case Study Research*. Thousand Oaks, CA: Sage Publications, Inc.

Strauss, A. L. (1987). *Qualitative Analysis for Social Scientists.* London: Cambridge University Press

Strauss, A., & Corbin, J. (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Tam, M. (2000). Constructivism, instructional design, and technology: Implications for transforming distance learning. *Educational Technology & Society, 3*(2), 50-60.

Taylor P, Maor D. (2000). *Assessing the efficacy of online teaching with the Constructivist On-Line Learning Environment Survey.* Paper presented at: Flexible Futures in Tertiary Teaching 9th Annual Teaching Learning Forum. Perth; Australia. Retrieved September 16, 2011 from http://lsn.curtin.edu.au/tlf/tlf2000/taylor.html

Tessmer, M. & Wedman, J. (1995) Context-sensitive instructional design models: A response to design research, studies and criticism. *Performance Improvement Quarterly, 8*(3), 38-54.

Thang, S.W. (2003). Investigating the 'problem' of memorization among Malaysian English as second language (ESL) learners. *Jurnal e-Sumber, vol. 1.* http://pkukmweb.ukm.my/~ebangi/jurnal%20e-sumber-arkib/Thang-5.pdf

Tharp, R. G., & Gallimore, R. (1988). *Rousing Minds to Life: Teaching, Learning, and Schooling in Social Context.* New York: Cambridge University Press.

Thompson, C. (1999). *Adults Learn Differently Than Children.* Retrieved September 16, 2011 from http://trainingsys.com/articles/adultslearn.html

Tripp, S.D. (1991). *Two theories of design and instructional design.* In Proceedings of selected research presentations at the annual convention of the Association for Educational Communications and Technology.

Van Merriënboer, J. J. G. and Sluijsmans, D. M. A. (2009). Toward a synthesis of cognitive load theory, four-component instructional design, and self-directed learning. *Educational Psychology Review, 21*(1), 55-66.

Van Merriënboer, J. J. G. and Kirschner, P. A. (2007). *Ten Steps to ComplexLearning: A Systematic Approach to Four-Component Instructional Design.* New Jersey: Lawrence Erlbaum.

Van Merriënboer, J. J.G. and Sweller, J. (2005). Cognitive load theory and complex learning: Recent developments and future directions.*Educational Psychology Review, 17,* 147-177.

Vrasidas C. and Mclsaac M. S. (2000). Principles of pedagogy and evaluation for web-based learning. *Education Media International, 37*(2), 105-111.

Vygotsky L S (1978) *Mind in society.* Harvard University Press, Cambridge.

Wagner, C. (2004). Wiki: A Technology For Conversational Knowledge Management And Group Collaboration. *Communications of the Association for Information Systems, 13*, 265-289.

Wenger E. (1998). *Communities of Practice: Learning, Meaning and Identity*. chapter 10. Cambridge, CUP

Williams, P. (2002). The learning web: the development, implementation and evaluation of internet based undergraduate materials for the teaching of key skills. *Action for Learning in Higher Education 3,* 1, pp.40-53

Williams, R. N. (1992). The human context of agency. *American Psychologist, 47*(6), 752-760.

Willis, J. (1995). Recursive, reflective instructional design model based on constructivist-interpretist theory. *Educational Technology, 35* (6), 5-23.

Windschitt, M. (1998). The WWW and classroom research: What path should we take? *Educational Researcher, 27*(1), 28-33.

Winn, W. (1997). Advantages of a theory-based curriculum in instructional technology. *Educational Technology, 37*(1), 34-41.

Xu, L. (2007). Project the wiki way: using wiki for computer science course project management. *Journal of Computing Sciences in Colleges, 22*(6)

Yamagata-Lynch, L. C. (2003). Using activity theory as an analytical lens for examining technology professional development in schools. *Mind, Culture, and Activity, 10*(2), 100–119.

Yamagata-Lynch, L. C. (2010). *Activity Systems Analysis Methods: Understanding Complex Learning Environments.* New York: Springer.

Appendix 1

Components in the Activity System

Eight-step-model for translating activity systems (Mwanza, 2002)

Identify the…		Questions to ask
Step 1	Activity	What sort of activity am I interested in?
Step 2	Objective	Why is this activity taking place?
Step 3	Subjects	Who is involved in carrying out this activity?
Step 4	Tools	By what means are the subjects carrying out this activity?
Step 5	Rules and regulations	Are there any cultural norms, rules and regulation governing the performance of the activity?
Step 6	Division of labor	Who is responsible for what when carrying out this activity and how are the roles organized?
Step 7	Community	What is the environment in which the activity is carried out?
Step 8	Outcome	What is the desired outcome from this activity?

Appendix 2

Interview Protocol

Introduction:

1) review research topic,
2) confirm participant consent,
3) answer participant queries about research (if any),
4) establish rapport through relevant personal background.

Semi-structured Interview Questions

RQ 1: How does the designed activity system facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

- What do you like or not like about the three activity tasks? (Video editing, Shared learning contract and R&D ID Project)
- The activities were designed to help you develop self-directed learning. Did you experience SDL? If yes, please elaborate. If not, why? (*Clarify definition of SDL if needed)

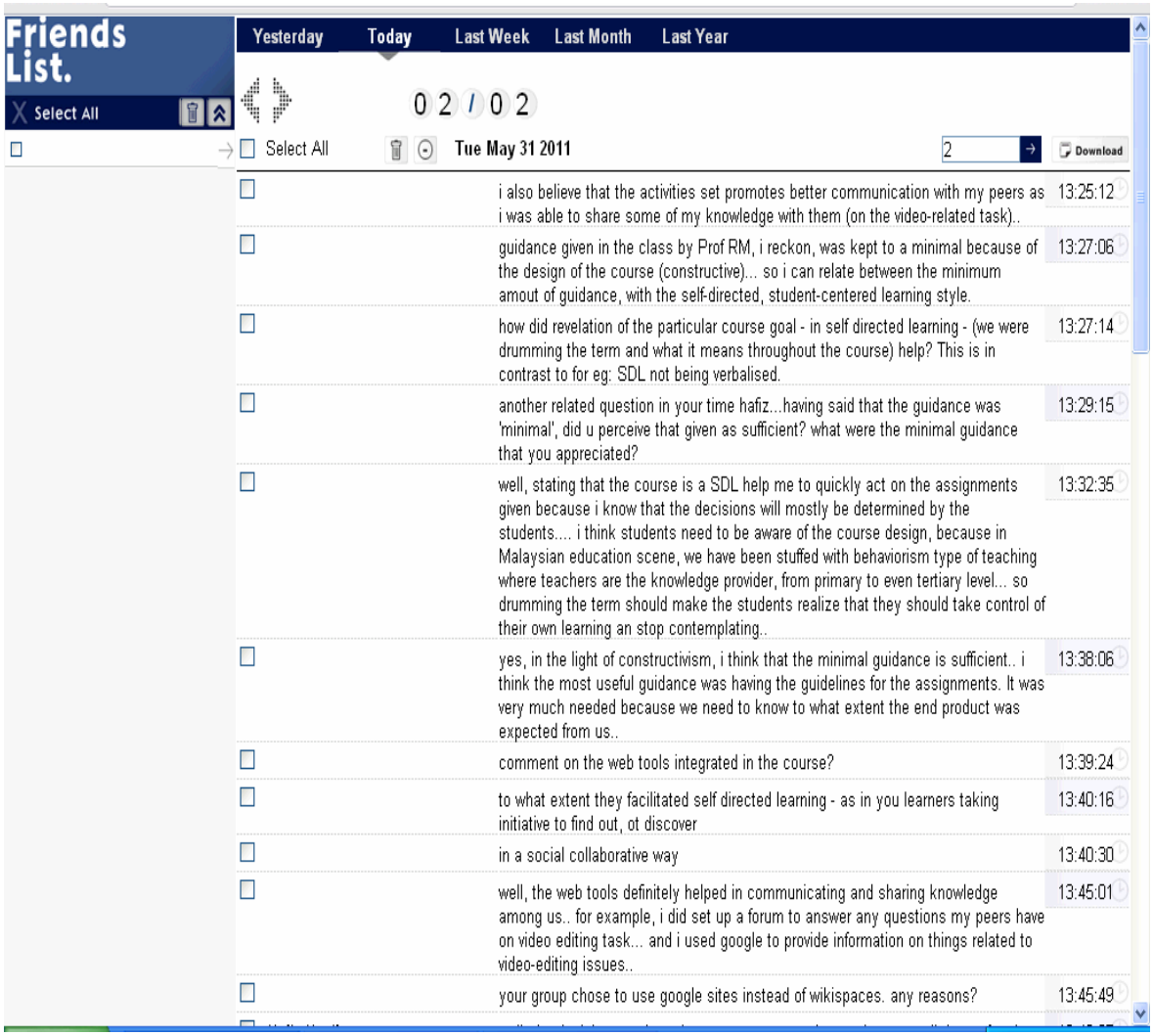
RQ2: How are web-based technologies integrated to facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

- The use of web-based technologies was encouraged in the course. Please tell me what tools you used to help achieve learning goals in the course. (personal, group and course required web tools)
- How did the use of specific web-based technologies help you develop self-directed learning?

RQ3: How do the phases of transition facilitate the development of self-directed learning in an e-socioconstructivist learning environment (eSCLE)?

- How was the journey of self-directed learning? What did you encounter (mentally, physically) and feel (emotionally) from the beginning to the end?
- How did you cope / adapt in difficult situations?

Facebook Chat Interface and History



Appendix 3

Informed Consent Form

Research Project Title: Self-Directed Learning in an e-SocioConstructivist Learning Environment

Investigator: Foo Sze-yeng

With reference to the above research project, the recordings of classroom activity, interviews, questionnaires and online collaboration and discussion would be observed, collected and analyzed for the purpose of improving teaching and learning throughout the duration of the research.

However, rest assured that in no way will the information be circulated out of the research context. The research materials will be strictly confidential to the researcher and stored with complete security throughout the research. There will be no foreseen risks in participation as any reported data will not be associated with your personal information. Confidentiality will be strictly observed. All correspondences will be private documents and will not be circulated.

Your involvement would benefit the instructional design and technology research community, facilitating the planning of future instruction to enhance the scholarship of teaching and learning.

Should you feel reluctant to continue, you are free to withdraw from the study upon notification. Questions of clarification or new information are encouraged throughout your participation.

Participant Signature: _____ Date: _____

Email: _____

Telephone Number: _____

Appendix 4

An extract from Field Note

Observed Activity	Researcher Impression
Week 5 (5th – February 2010) Date: 5/2/2010 Time: 3:00-6:00 pm Venue: Computer Lab MK1 3:00pm Group Presentation • Group 1: L1, L4, L10, L11 • Group 2: L3, L6, L8 • Group 3: L5, L7, L9, L13 • Group 4: L2, L12, L14	L4 is comfortable with technology, good presentation skills using *Prezi*. (*To get him to give a technology session for Assignment 1). L8 has ideas but can't sequence coherently. The group has creative suggestions. (*To set assignment for training workshop – this team to handle instructional design) L9 is a diligent learner, always setting out to please the instructor. She has working experience as ID (*To have her share Gagne's ID model and her experience)
4.30pm S from PUSMAL presents training contexts. Brought new members: H and T Q&A Session	S presents goals and objectives of Positive Seed Training Program. Together, groups brainstorm synchronized solutions. H and T move around the groups, sitting in for about 15 minutes in each group. They rarely give their opinion. S says they are members of PUSMAL there to get an idea of the event that ID class is going to present. Group 1 discussion is very lively, everyone is throwing ideas. So I asked them to first assign ID roles. Group 2 is trying to identify ID models and processes from the book. They have divided reading (jigsaw reading). Group 3 is viewing examples of instructional videos. Later they discuss how they could use some of the ideas in their video media task. Group 4 members seem to be doing nothing productive at first glance. Perhaps, they are

5:30pm Reflection and Discussion	'thinkers' more than 'interactors'. They are thinking of project management roles. Overall, inquiry learning going on. Groups come together for final discussion / reflection. Chaired by S, the groups manage to decide on a training instructional solution. Group 1: Face to face training Group 2: e-learning (sharing) platform Group 3: Media publication (Video) Group 4: Guidebook Interesting learner quotes: L12: *"I thought this was a piece of cake for me but somehow things don't fall into place".* L3: *"That's right, my group is facing a chaotic work table. We don't have all the theories but yet have to work based on ID models and principles. But, I'm motivating myself to think positive…perhaps things just hasn't fallen in place yet".* *L12 and L3 contrasting response – for further observation – is MOTIVATION a factor for facilitating the development of SDL? *Chaotic* – comment in week 5. Would this be resolved? L9: "*Actually, what I found out was that, I already have this knowledge inside my head, maybe a part of my tacit knowledge…I have followed but without knowing it".*

Appendix 5

Activity System Analysis
(Setting 1: R&D ID Project)

Emergent Key themes and Categories

Activity Setting

Label: R&D ID Project
Observer: Researcher
Observation Period: 8/1/2010 to 8/6/2010
Client: PUSMAL (Positive Seed)
Consumer: University Graduate Entrepreneurs
Process Activity: Reflective diary, project management, brainstorming.
Product of Activity: Pilot Training, e-Sharing platform, Media (Video), Guidebook.

Abbreviations: (I=Instructor, L=Learner etc)

1.Individual Plane of Development

Analytic Focus:
How individuals self-direct their learning through involvement in the designed activities?

Key Themes	Category	Description
Metacognition	Ponder How to learn	-Had to think about new strategies to learn. -Had so many new things (skills, knowledge) to learn.
Monitoring / Management	Goals Datelines Time Management	-Had to juggle work, family, study. -Didn't know how to manage the workload. -Used the learning contract to set target dates.
Evaluation	Self-reflection Development	-When faced with breakdowns, take a moment to reflect on what went wrong. -Try to enjoy the learning experience -Try my best to stay positive. -Complete personality / learning style inventories to help create awareness of own capability. -Identity as a self-directed learner

2. Interpersonal Plane of Development

Analytic Focus:
How individuals self-direct their learning through collaborative activities with others?

Key Themes	Category	Description
Negotiation	Understand Meaning Share	-Delegate tasks -All came back with report -So many perspectives of the task. -Negotiate the best understanding of the task. -Implement collaboratively
Guidance	Scaffolds Prompts	-Instructor / Tutor gave reflective cues. -Resources are shared. -Groups able to benchmark their progress through whole class discussion / brainstorming sessions with instructor. -Apprenticeship (there are times some are experts some are novices)
Interaction	Groupings Inquiry	-Given the choice of who to work with in the group work. -Learn to ask a question and search for an answer. -Close buddies in small groups interacting 24/7 to provide support and help each other solve problems.

3. Institution/Community Plane of Development

Analytic Focus:
How individuals self-direct their learning as they interact in community-based activities?

Key Themes	Category	Description
Immersion	Solving problem Get Involved	-Get involved and understand the needs and requirements of the community. -Identify the gaps for intervention through heart-to-heart talk with the client / target audience.
Performance	In action	-Research skills essential to get up-to-date information -The preparation for the presentation of the R&D ID project findings in the symposium was tedious self-directed work but guidance given in terms of how to write a paper, how to design a poster. -Stand up and perform (show what you know) – the preparation helps develop continuous improvement.

Leadership	Empowered Learner Control	-Peer tutoring system to empower learner engagement -Learners are in control of decision making, problem solving at various levels. -Decentralized power system where small group leaders are accountable

4. Technology Plane of Development

Analytic Focus:
How individuals self-direct their learning as they interact with web-based technologies?

Key Themes	Category	Description
Consumption	Referencing Knowledge Hub Resources	-The web is a repository of information -Need digital literacy skills to make sense of where and how to find what is needed -Need to organize and synthesize information, not just collect information.
Production	Post Create Generate	-New ideas and media is created to share knowledge - These are posted online on suitable platforms. -User-generated content is a reflection of socio-cultural negotiated knowledge.
Interaction	Communicate Mediate Multi-way	-Social media and appropriate web technology are chosen to communicate virtually between weekly meetings. - Web technology mediate the interaction between learner and content, learner and instructor, learner and learner 24/7.

Appendix 6

Reference for Survey Questionnaire

Aspects of the Learning Process Where Learners Can Assume Some Control

1. Assessing Needs

1.1 Choice of individual techniques
1.2 Choice of group techniques
1.3 Controlling how needs information is reported
1.4 Controlling how needs information is used

2. Setting goals

2.1 Specifying objectives
2.2 Determining the nature of the learning
    2.2.1 Deciding on competency or mastery learning -vs- pleasure or interest learning
    2.2.2 Deciding on the types of questions to be asked and answered during learning efforts
    2.2.3 Determining emphases to be placed on the application of the knowledge or skill acquired
2.3 Changing ("evolution") objectives over the period of a learning experience
2.4 Use of learning contracts
    2.4.1 Making various learning choices or selecting from various options
    2.4.2 Decisions on how to achieve objectives

3. Specifying learning content

3.1 Decisions on adjusting levels of difficulty
3.2 Controlling sequence of learning material
3.3 Choices on knowledge types (psychomotor, cognition, affective)
3.4 Decision on theory -vs- practice or application
3.5 Deciding on level of competency
3.6 Decisions on actual content
    3.6.1 Choices on financial or other costs involved in the learning effort
    3.6.2 Deciding on the help, resources, or experiences required for the content
3.7 Prioritizing the learning content
3.8 Deciding on the major planning type, such as self, other learners, experts, etc.

4. Pacing the learning

4.1 Amount of time devoted to teacher presentations
4.2 Amount of time spent on teacher to learner interactions
4.3 Amount of time spent on learner to learner interactions
4.4 Amount of time spent on individualized learning activities
4.5 Deciding on pace of movement through learning experiences
4.6 Decisions on when to complete parts or all of the activities

5. Choosing the instructional methods, techniques, and devices

5.1 Selection of options for technological support and instructional devices
5.2 Choice of instructional method or technique
5.3 Type of learning resources to be used
5.4 Choice of learning modality (sight, sound, touch, etc.) for determining how best to learn
5.5 Choices on opportunities for learners, learner and teacher, small group, or large group discussion

6. Controlling the learning environment
6.1 Decision on manipulating physical/environmental features
6.2 Deciding to deal with emotional/psychological impediments

6.3 Choices on ways to confront social/cultural barriers
6.4 Opportunities to match personal learning style preferences with informational presentations

7. Promoting introspection, reflection, and critical thinking

7.1 Deciding on means for interpreting theory
7.2 Choices on means for reporting/recording critical reflections
7.3 Decision on use of reflective practitioner techniques
7.4 Opportunities provided for practicing decision-making, problem solving, and policy formulation
7.5 Making opportunities to seek clarity or to clarify ideas available
7.6 Choices on practical ways to apply new learnings

8. Instructor's/trainer's role

8.1 Choice of the role or nature of didactic (lecturing) presentations
8.2 Choice of the role or nature of socratic (questioning) techniques to be used
8.3 Choice of the role or nature of facilitative (guiding the learning process) procedures

9. Evaluating the learning

9.1 Choice on the use and type of testing
    9.1.1 Deciding on the nature and use of any reviewing
    9.1.2 Opportunities for practice testing available
    9.1.3 Opportunities for retesting available
    9.1.4 Opportunities available for choosing type of testing, if any, to be used
    9.1.5 Decisions on weight given to any test results
9.2 Choices on type of feedback to be used
9.2.1 Deciding on type of instructor's feedback to learner
9.2.2 Deciding on type of learner's feedback to instructor
9.3 Choices on means for validating achievements (learnings)
9.4 Deciding on nature of learning outcomes
    9.4.1 Choosing type of final products
        9.4.1.1 Deciding how evidence of learning is reported or presented
        9.4.1.2 Opportunities made available to revise and resubmit final products
        9.4.1.3 Decisions on the nature of any written products
    9.4.2 Decision on weight given to final products
    9.4.3 Deciding on level of practicality of outcomes
        9.4.3.1 Opportunities to relate learning to employment/future employment
        9.4.3.2 Opportunities to propose knowledge application ideas
    9.4.4 Deciding on nature of the benefits from any learning
        9.4.4.1 Opportunities to propose immediate benefits versus long-term benefits
        9.4.4.2 Opportunities to seek various types of benefits or acquisition of new skills
9.5 Deciding on the nature of any follow-up evaluation
    9.5.1 Determining how knowledge can be maintained over time
    9.5.2 Determining how concepts are applied
    9.5.3 Opportunities provided to review or redo material
    9.5.4 Follow-up or spin-off learning choices
9.6 Opportunities made available to exit learning experience and return later if appropriate
9.7 Decision on the type of grading used or completion rewards to be received
9.8 Choosing the nature of any evaluation of instructor and learning experience
9.9 Choices on the use and/or type of learning contracts

(Source: Hiemstra, 1994: 85-86)

Appendix 7

Checklists circulated to help create awareness / evaluate Self-Directed Learning

Example 1: PERSONAL RATING ON SELF-DIRECTED LEARNING COMPETENCIES

Name _____ Date _____

This form is designed to assist you in assessing your level of competence pertaining to various self-directed learning competencies. Knowing such information will help you identify those areas of strength that can be used in future self-study efforts and those that may need to be enhanced in various ways.

For each potential content area, please check the most relevant column indicating a "self-rating." To assist in the decision regarding which column to check for each area, use the information below. Make your best estimation of current strengths and weaknesses. In addition, please feel free to add other content areas you believe would be of value in carrying out future self-directed learning activities.

- **DK** If you believe you currently do not have any skills pertaining to the listed competency or don't know what skills you possess. This may mean that you will need or will want to develop such competency through future discussion, reading, practice, etc.
- **LO** If your current competence related to the listed area is especially low, but could be raised toward a desired level through specific learning experiences.
- **MD** If your past experiences have provided part of the desired competence and some learning experiences or activities would develop the remainder.
- **HI** If your past experiences and activities have substantially developed the listed area.

SELF-RATING ON SELF-DIRECTED LEARNING COMPETENCIES

(Self-rate your competency by checking the appropriate column box)

Competency Area	DK	LO	MD	HI
1. An understanding of the differences in assumptions about learning and the skills required for self-directed study	.	.	.	.
2. A concept of myself as being a non-dependent and self-directed learner	.	.	.	.
3. An ability to relate to peers collaboratively in seeking and providing help pertaining to learning activities	.	.	.	.
4. The ability to diagnose my own learning needs realistically	.	.	.	.
5. The ability to translate learning needs into learning goals, plans, and activities	.	.	.	.
6. The ability to relate to teachers as helpers or facilitators and take initiative in making use of their expertise	.	.	.	.
7. The ability to identify human and material resources appropriate to different learning needs and goals	.	.	.	.
8. The ability to select and utilize effective strategies for making good use of learning resources	.	.	.	.
9. The ability to collect and validate evidence pertaining to my accomplishment of various kinds of learning objectives	.	.	.	.
10. Other:	.	.	.	.
11. Other:	.	.	.	.
12. Other:	.	.	.	.

(Adapted from Knowles, M. S. (1975). *Self-directed learning*. Chicago: Follett.)

Example 2: Competencies for Carrying out Self-Directed Learning Projects

☐ The ability to develop and be in touch with curiosities; to engage in divergent thinking.

☐ The ability to formulate questions, based on personal curiosities, that are answerable through inquiry (in contrast to questions answerable by authority / faith)

☐ The ability to perceive yourself objectively and accept feedback from others about personal performance non-defensively.

☐ The ability to diagnose your own learning needs in light of models of competence required for performing life roles.

☐ The ability to identify human, material and experiential resources for accomplishing various kinds of learning objectives.

☐ The ability to identify data required to answer various kinds of questions.

☐ The ability to locate the most relevant and reliable sources of any required or acquired data.

☐ The ability to select and use the most efficient means for collecting any required data from various sources.

☐ The ability to organize, analyze and evaluate the data so as to get valid answers to questions.

☐ The ability to design a plan of strategies for making use of appropriate learning resources in answering questions or meeting learning needs.

☐ The ability to carry out a learning plan systematically and sequentially. This skill is the beginning of the ability to engage in convergent thinking.

☐ The ability to collect evidence of the accomplishment of learning objectives and have it validated through subsequent performance.

Adapted from Knowles M. S. (1975)

Module Orientation

Student Pre-Test Proficiency Profile

Masters in Instructional Technology

insert jpeg file of self-photo here

SECTION 1 – Personal Data: *Please type* in capitals AND small letters *or insert tick ✓ in appropriate boxes.*

Full Name: _____ ☐ Male ☐ female

UM Matric No: _____ Equipment owned:

NRIC / passport: _____ ☐ PC

Email address: _____ ☐ Laptop

Mailing address: _____ ☐ Printer

Website address: _____ ☐ Scanner

Semester no.: _____ ☐ Digital Camera

_____ ☐ 3G broadband/wireless

Mobile phone: _____ Transport available:

Home phone *Local Klang Valley*: _____ ☐ Drive own car

Home phone *Hometown*: _____ ☐ Ride own motorbike

Student status: ☐ Self-financed ☐ Sponsored by: _____

SECTION 2 – Experience/Academic Profile: *Please use BLOCK LETTERS or tick ✓ in appropriate boxes.*

What have you learned/improved from your past semester/prior knowledge and skills?
(tick the boxes for all the concepts you are familiar with)

☐ Psychology of Learning	☐ Andragogy	☐ Interactive
☐ Behaviorism	☐ Pedagogy	☐ Animation
☐ Cognitivism	☐ Distance learning	☐ e-mail
☐ Constructivism	☐ Lifelong learning	☐ e-book
☐ Models of Learning	☐ Open university	☐ e-group
☐ Mastery Learning	☐ Asynchronous Learning	☐ e-library
☐ Group Synergy	☐ Synchronous Learning	☐ e-bulletin board
☐ Total physical response	☐ Inductive/deductive Thinking	☐ Blogging
☐ Gaming/simulation	☐ Reflective Thinking	☐ Multimedia
☐ Audience Analysis	☐ Learning Objects	☐ Courseware
☐ Schemata	☐ Learning Objectives	☐ Operating system
☐ History of Teaching/Learning	☐ Learning Outcome	☐ Application software
☐ Multiple Intelligences	☐ Bloom's Taxonomy	☐ Yahoo/MSN messenger
☐ Cognition	☐ Computer system	☐ Online learning

☐	Attention / Retention	☐	Computer Components	☐	e-learning
☐	Information Processing Model	☐	Hardware/software	☐	Mobile-learning
☐	Learning styles	☐	Search engine	☐	Real-time
☐	Learning organization	☐	Chat room	☐	Web-publishing

Others (please state): ☐

Use the table format & fill-black *the appropriate box, 1 = Very Low, 5 = Very High*

What is the level of your **computer proficiency** in the following areas?

I am comfortable typing text in Microsoft word	1	2	3	4	5
I am familiar with all the menus & functions in Microsoft word	1	2	3	4	5
I know how to use Microsoft auto spell-check & thesaurus functions	1	2	3	4	5
I am familiar with inserting symbols & special characters into a word file	1	2	3	4	5
I know how to create/modify table formats in Microsoft word	1	2	3	4	5
I know how to insert digital pictures into a word document	1	2	3	4	5
I can use the Smartboard to digitize my signature and save it as a jpeg file	1	2	3	4	5
I am familiar with universal standards in allocating softcopy filenames	1	2	3	4	5
My softcopy files are organized into systematic folders using Windows Explorer	1	2	3	4	5
I archive my softcopy files regularly according to dates & categories	1	2	3	4	5
I know how to save & transfer files using floppy disks	1	2	3	4	5
I know how to burn CD's in various formats (data files, music files, video etc)	1	2	3	4	5
I have my own thumbdrive/portable harddisk and use it regularly wherever I am	1	2	3	4	5
I am very familiar with GOOGLE and other internet search engines	1	2	3	4	5

Did answering these questions make you realize/learn anything new? ☐ yes ☐ no

If yes, what did you learn?

What is your type of **learning style preference**?

Log onto web browser and complete the online test in the following website:
http://www.engr.ncsu.edu/learningstyles/ilsweb.html

Fill in your test results below:

☐	☐	Active / Reflective Learning	☐	☐	Visual / Verbal Learning
☐	☐	Sensing / Intuitive Learning	☐	☐	Sequential / Global Learning

What is your type of **communication style preference**?
Answer the following questions honestly / candidly & insert tick ✓ in the appropriate boxes

Do you like to talk? ☐ yes ☐ No ☐ sometimes

Are you afraid to talk in front of a crowd?	☐	yes	☐	No	☐	sometimes
Can you be talkative with strangers?	☐	yes	☐	No	☐	unsure
You use your mobile hand phone to call	☐	a lot	☐	Seldom	☐	sometimes
You talk on your mobile hand phone mostly for	☐	work	☐	Family	☐	friends
You use SMS on your mobile hand phone	☐	a lot	☐	Seldom	☐	sometimes
You SMS mostly for	☐	work	☐	Family	☐	friends
You email / chat on your PC / laptop	☐	a lot	☐	Seldom	☐	sometimes
You use your PC mostly for	☐	work	☐	Games	☐	communication

What is the level of your **computer experience**? In what type of application programs? And how long?

Internet explorer	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Word Processing (MS Word)	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Spreadsheets (MSExcel)	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Power Point Presentation	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Photo shop/photo editor	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Drawing (Illustrator/CAD)	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
DTP (Quark/Pagemaker)	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Web publisher	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Animation	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs
Video Editing	☐	None	☐	1-2 yrs	☐	2-5 yrs	☐ > 5 yrs

Other programs: _____

What new knowledge do you hope to learn during this semester?

How would you rate your language proficiency?

Verbal (English)	☐	Weak	☐	average	☐	Good	☐ excellent
Written (English)	☐	Weak	☐	average	☐	Good	☐ excellent
Verbal (Bahasa Malaysia)	☐	Weak	☐	average	☐	Good	☐ excellent
Written (Bahasa Malaysia)	☐	Weak	☐	average	☐	Good	☐ excellent

Which language do you prefer for your classes? ☐ English ☐ Bahasa

What other languages do you know? Verbal: _____

Written: _____

What is your **current learning environment**?

Who are you currently living with? ☐ friends ☐ Parents ☐ spouse/family

Any children in your house? How many? Age? _____

Do you talk to your friends/family about your work/studies? ☐ Yes ☐ No

Who is your official academic advisor? _____

Do you talk to your academic advisor on a regular basis? ☐ Yes ☐ No

What type of internet access do you have? *(tick all/any relevant)*

☐ LAN system at work/ University of Malaya
☐ GPRS/WAP mobile access (palmtop/handph)
☐ Do not have any access at all
☐ Fast-speed streamyx/optics at home
☐ Slow-speed phone line at home
☐ Other: _____

What type of visual media do you have at home? ☐ TV ☐ ASTRO ☐ VCD/DVD

Give a ranking from (1=most preferred) to (6=least preferred) for the following modes of input

☐ TV ☐ cinema ☐ newspaper ☐ books ☐ Internet ☐ magazines

In a month, how much do you typically spend on
- buying books/magazines? RM _____
- watching movies/buying VCD's? RM _____
- photocopies/binding for coursework? RM _____
- hand phone/SMS bills? RM _____

This class will require you to buy materials and/or spend on production expenses for your class assignments. Will this be a problem? ☐ yes ☐ no

What is your **learning experience background**?

How old were you when you started pre-school? _____ years old

Did your parents help you with homework? ☐ yes ☐ No ☐ sometimes

If you have children, do/would you help them with homework? _____

Did you enjoy your primary school education? ☐ yes ☐ No ☐ forgot

Why? _____

Did you enjoy your secondary school education? ☐ yes ☐ No ☐ forgot

Why? _____

What was your ambition when you were a child? _____

Is the program you are studying now what you originally wanted? ☐ Yes ☐ No

Are you enjoying your education now? ☐ yes ☐ No ☐ don't know

Why? _____

In five years time, what do you envision yourself doing? ***(tick ONLY 5 boxes)***

☐ Further education/development
☐ Working mostly with young children
☐ Enough of studying – time to work now
☐ Working mostly with adults

☐	Working mostly with teenagers	☐	Prefer quiet job/less interaction with people
☐	Planning/leading important jobs	☐	Stable/well-defined/consistent jobs
☐	Work hard to improve career/title	☐	Balance work & personal life
☐	Fast-pace/challenging work	☐	Scheduled/systematic/no overtime work
☐	Creative in finding new interesting work	☐	Practice to master current job/abilities
☐	Private sector/competitive market	☐	Government sector/pension plan

SECTION 3 – Reflection information: *Please type* in capitals AND small letters *or insert tick ✓ in appropriate boxes.*

Did you find the questions in this questionnaire difficult to understand?	☐ Yes	☐ no
Are you curious about why you are filling in this questionnaire?	☐ Yes	☐ no
Did you have any prior knowledge about the instructor of this course?	☐ Yes	☐ no

If you could ask any question now, what would it be?

Signature: insert jpeg file of signature here Date: _____

EMPOWERMENT FOR ENGAGEMENT (Em4En) QUESTIONNAIRE

Learners' Beliefs on Roles and Responsibilities in Instructional Design

SECTION 1 – Demographic Data

Please fill in, insert tick ✓or underline appropriately.

Name (optional): _____ ☐ Male ☐ Female

Age _____

Highest Qualification *(Eg: Bachelor of Arts)*

Profession

Online Learning Experience ____ Months / Years / Not applicable

Experience with Online Tools Facebook / Blog / Wiki / Moodle / _____(Other

Any Instructional Design Experience? (elaborate) _____

SECTION 2

This is your personal response.
Underline to indicate who you think should assume ***more control;*** *in choosing and deciding among various strategies in the following learning processes. Elaborate on your choice in the space provided.*

Instructional Processes	**Who should have more control?**	**Your Reason?**
1. Assessing the Learning Needs	Teacher / Learner	
2.Setting the Learning Goals	Teacher / Learner	
3. Specifying the Learning Content	Teacher / Learner	

4. Determining the Pace of Learning	Teacher / Learner	
5. Selecting the Instructional Methods, Techniques and Devices	Teacher / Learner	
6. Controlling the Learning Environment	Teacher / Learner	
7. Promoting Introspection, Reflection and Critical Thinking	Teacher / Learner	
8. Determining Instructors' Role	Teacher / Learner	
9. Evaluating the Learning	Teacher / Learner	

Appendix 10

Collating Survey Results Online

7. Other online tools you are familiar with?

#	Response
1	freewebs
1	google sites
1	No...
1	Photo hosting (Flickr, Fotopages)
1	QQ, sosio, (chinese web)
1	wordpress, joomla, drupal
1	yahoo group, skype, yahoo messenger

8. Any instructional design experience? Please elaborate.

#	Response
1	As an arabic teacher in primary school, which is a new syllabus/programme called y-QAF, there is no sufficient and suitable teaching tools for the student.So, i designed teaching tools using powerpoint and Quran in words. That's the best i can do for my primary school students. I purposely registered for this course, to learn new things that can can be helpful for me to teach the students.
1	Enhanced the module for ICTL Programme for Secondary School and developed this module for ICTL Transformation Curriculum for primary school for the Curriculum Development Centre, Ministry Of Education
1	Have done a project to find how to teach fractions effectively for Year 5 students. I have use ADDIE (Analysis, Design, Development, Implementation, and Evaluation) framework to guide me to complete this project. Analysis – Use questionnaires to do analysis on student's background and context background. In this phase also, define the problem and what the root cause is. Design – In this phase, I plan the proposed solution for the root cause that has been define. Development – From all the proposed solution, choose the best solution that can be implementing. In this phase, I and my team find what we can do in the implementation phase. Implementation – Implement all the proposed solution and find if it is work or not. Evaluation – Evaluate on what we have done.
1	in my last semester in PXGT6104, our group had to design a course for bahasa malaysia subject so we used two frameworks include of ADDIE and TPCK.Indeed my experience in this list trace back to the projects which I have doen during my master program.
1	Just blogger and wikispaces for my chinese's class student and History Class only. Just a handy one
2	No
1	no, just work on online tools mentioned on question 6 and 7 most of the time in communication based
2	no.
1	Started creating storyboards for Multimedia Learning System while working for Multimedia University, Melaka campus. I was given a crash course on Flash but find it too difficult. However, it is working on this that made me interested in ID.
1	Supposedly, was working as an "Instructional Designer" for more than 3 years in a courseware development company (develop mostly courseware for national schools for MOE. But there were one or two prototype development for adult learning for training program i.e. LHDN). However, lack the instructional designing experience as basically the design has already been done and I'm just a passenger in the boat in developing the "designed instruction" during the development phase. The work is mostly writing storyboards from a raw Lesson Design prepared by SMEs (teachers). Nevertheless, I feel that I gained quite an experience during that phase especially on arising issues of ID importance after a product is developed and the effects of poor ID foundation and implementation AND also issues in ID team and the communication between IDs, SMEs, Technical and Development people.
1	There were two subjects that I took when I was doing my degree, 'Reka bentuk instruksional dan Teknologi' and 'Material Development & Adaptation', which require students to design and develop a product for learning as one of the assignments. Several ID models are required to be used in completing the assignment, particularly the ASSURE model.
1	Yes, last semester in group I design a training called digital storytelling, I used ADDIE model during this process. Then, for other class that is internet, I have to design a website. I also used ADDIE model during this two classes. I read some of instructional design books and journal because this is the basic and at that time, to design something, I must have a basic

knowledge. [illegible]

SECTION 2: Do you think the TEACHER or LEARNER should assume MORE control in the following instructional process? Why? And how can that be done?

9. Assessing Learning Needs

#	Response
	Both Teacher know why to teach, what to teach and how to teach. [illegible]
	I think teacher should assume MORE control in the following instructional process because teacher is the one who [illegible]
	LEARNER. Because learner knows what [illegible]
	Learning needs assessment is a crucial stage in practice. [illegible]
	Students should be able to assess their learning needs [illegible]
	Student [illegible]
	Teacher [illegible]
	Teacher should assume more control because [illegible]
	Teacher, as what educational expert said, [illegible]
	Teacher, [illegible]
	The teacher should guide the learner [illegible]
	The teacher should have more control because [illegible]
	The teacher should see whether the learner as novice learner or advance learner. [illegible]
	When working with [illegible]

Appendix 11

Activity Tasks

Assignment 1: Developing an Instructional Video

We have provided the materials in the form of workshop videos conducted at the Academic Development Centre(ADeC) in UM.

In pairs, select a video from the available 8 topics and finalize your choice on Moodle. Every pair should work on a different video.

The available videos are:
1) Making Group Oral Presentation
2) Stand and Deliver
3) Impromptu Speech Making
4) Application of Instructional Cognitive Strategies in Design of Instruction Workshop
5) Qualitative Research Series
6) Socratic Questioning
7) Andragogical Principles & Practices: Teaching and Learning Theories Workshop
8) Academic Writing and Role of the Supervisor

Your task is to shorten your chosen video into a 20-minute-long instructional video. It is important that you are clear on the criteria of an instructional video before you start the design. (REMINDER: The edited video should not exceed 30 minutes!)

Another criteria you should fulfill is to develop the instructional video for self-directed learning, where the viewer could use it to learn specific content or skills to develop specific competencies. Follow the ID stages and your creativity to make the video instructive and interesting.

You may use any simple editing tools to put together the video. What is important is the process that you follow in the development of the instructional video.

The deliverables would be (a) your edited video and (b)a brief essay to elaborate on your design and to justify the design of your self-directed instructional video.

(Due: 5 March 2010; Marks = 15%)

Appendix 12

Activity Tasks (2)

ASSIGNMENT 2: My Learning Contract

The objective of this assignment is to design and reflect upon your personal learning experience through a learning contract. Your learning contract will be a negotiated one between yourself, your facilitators and your peers.

Instructions

You will write the first version of your learning contract, based on the given framework. Create an account with Google (if needed) to enable you to upload your learning contract to Google Docs. Share your learning contract with your facilitators and peers by email invitation. Once you upload your learning contract, those invited would be able to edit/comment the document. Remember to save your edited version. Your learning contract will be reviewed / updated at least once weekly. You are advised to reflect on your learning needs and goals in tandem with development of projects, new input, discussions, tutorials etc. Your facilitators and peers may provide constructive comments as deemed appropriate. Whichever the case, you claim ownership and responsibility to your learning contract; where the documentation of efforts towards self-directed learning would be assessed.

Assessment (15%)

Assessment would be generally based on the following.

- Thoughtfulness
- Consistency
- Reflection
- Collaboration

You would NOT be penalized for not successfully achieving your specified learning goal, provided your efforts towards the goals are justifiable within your learning contract.

Date Due: Ongoing Assessment

Appendix 13

Activity Tasks (3)

Assignment 3: A research and development project in ID

An ID project will consist of the following team, Instructional Designer, Subject Matter Expert, Media Specialist or Producer, Programmer and a Project Manager. In this project you are to work in a group of at least 3 people.

A project is usually guided by an ID model in the planning, development and the evaluation to a problem related to teaching and learning.

You will be given a client who will need a solution in the form of "an Instructional Intervention". .

Your design and development will be guided throughout the course. Dates for completion of specific part of the project will be given.

PRODUCTS:

(An instructional material or a system that can be effectively delivered).

(*A guideline or training materials or system to help teachers/designers to use the materials)*

(*A guideline or training for teachers/instructional designers to prepare the materials appropriate for the level of instruction or to use the system.*

PROCESS

(The report should include the following)

· Project management (please read the chapter on this or search the web for more information. You may want to get yourself a copy of the Microsoft project, latest version and learn the tool)

· Client (You will be given a real client)

· Gantt chart (timelines)

· Diary / project activities and outcomes

· Roles/Responsibilities

· Costing

(The process guided by ID model from beginning to end):

· Rationale for the choice of ID model

· Instruments to collect data in the analysis phase (examples, needs analysis questionnaire, interview protocol, checklist, etc.)

· Instructional theories and principles applied in the design and development of the products / activities (explain the decisions that you make along the way using specific theories and principles)

· Description of what you do in each step according to the model (Example, methods of needs analysis, learner analysis, context analysis and task analysis and how you used the findings from each step as input for the next step)

· Evaluation plan

· Individual reflections on the assignment specifically your learning process (You may setup a group or a blog that your team members can contribute or view)

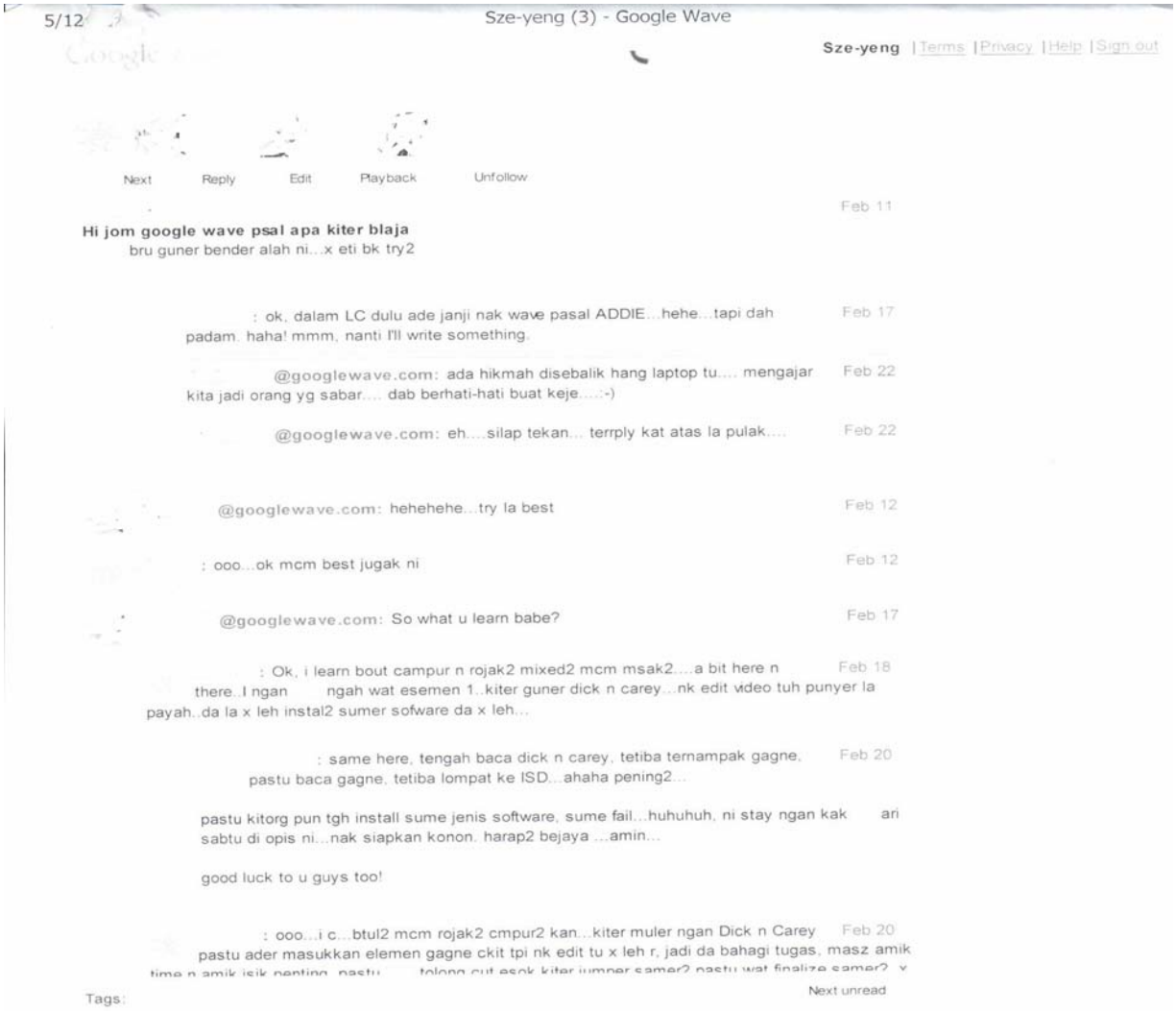
· References used (Please use latest APA style of referencing)

Your writing should follow a documentation standards agreed by all in the course.

(*Due Date: Akan ditentukan (to be informed), markah= 40%)*

Appendix 14

Extract of Google Wave conversation among four participants



5/12 Sze-yeng (3) - Google Wave

Sze-yeng | Terms | Privacy | Help | Sign out

Next Reply Edit Playback Unfollow

Feb 11

Hi jom google wave psal apa kiter blaja
bru guner bender alah ni...x eti bk try2

: ok, dalam LC dulu ade janji nak wave pasal ADDIE...hehe...tapi dah padam. haha! mmm, nanti I'll write something. Feb 17

@googlewave.com: ada hikmah disebalik hang laptop tu.... mengajar kita jadi orang yg sabar.... dab berhati-hati buat keje.....:-) Feb 22

@googlewave.com: eh....silap tekan... terrply kat atas la pulak.... Feb 22

@googlewave.com: hehehehe...try la best Feb 12

: ooo...ok mcm best jugak ni Feb 12

@googlewave.com: So what u learn babe? Feb 17

: Ok, i learn bout campur n rojak2 mixed2 mcm msak2....a bit here n there..I ngan ngah wat esemen 1..kiter guner dick n carey...nk edit video tuh punyer la payah..da la x leh instal2 sumer sofware da x leh... Feb 18

: same here, tengah baca dick n carey, tetiba ternampak gagne, pastu baca gagne, tetiba lompat ke ISD...ahaha pening2... Feb 20

pastu kitorg pun tgh install sume jenis software, sume fail...huhuhuh, ni stay ngan kak ari sabtu di opis ni...nak siapkan konon. harap2 bejaya ...amin...

good luck to u guys too!

: ooo...i c...btul2 mcm rojak2 cmpur2 kan...kiter muler ngan Dick n Carey pastu ader masukkan elemen gagne ckit tpi nk edit tu x leh r, jadi da bahagi tugas, masz amik time n amik isik penting, pastu tolong cut esok kiter jumper samer2 pastu wat finalize samer2 x Feb 20

Tags: Next unread

https://wave.google.com/wave/?pli=1...

Appendix 15

Extract of a Participant's Learning Contract

Student Name: _____

I am contracting for a Grade of A and will do the following to achieve that grade:

What are you going to learn? (objectives; knowledge, skills, attitudes, & values)	How are you going to learn it? (resources/strategies)	Target date for completion	How are you going to know that you learned it? (evidence - metacognition)	How are you going to prove you learned? (Verification of learning)	Self-Reflection	Peer's Comment	Instructor's Comment
Basic----------	----------	----------	----------	----------	----------	----------	
I will learn about what instructional design is about in general.	I will read the brief history of ID link given in Moodle: http://www.pignc-ispi.com/articles/education/brief%20history.htm I will read a book on Instructional Design: Instructional Design by Patricia L. Smith and Tillman J. Ragan ISBN 0-471-393533-3	28 february 2010	I will be able to: • state what "instruction" is • state the 3 major activities involved in ID process • state in what setting does instructional design may apply to	• I will post on moodle reflection forum to say that instruction is an intentionally or purposely arranged learning condition to facilitate or promote learning so that the learning goals are achieved. (one tick here! you hv done this) • I will share with my groupmates for assignment 3 that the 3 major	**FINAL REFLECTION** throughout the semester, I believe that we learnt a lot about instructional design, through guidance from the instructors and majorly from trial and error. despite being unable to proof my learning by doing the verification that I have stated, I think, the basic of ID is covered. I feel that ID is very interesting field and I am interested in it. However, i believe it requires tremendous amount of	Hi R, I have googlewave account, for my work actually in school, but we didnt use it as no one wants to use it, I find you interesting...heheh e, I mean I want to googlewave with u? but I dont really sure on how to use it,-m Hi m, glad to found someone who wants to explore gwave. Sure! why not, I'll start a wave with you :D - r Thanx R I like waving with you although its just a simple start but I want to say tq, hope we can wave more-M-	**Good idea to hv another column. I can feel your enthusiasm you put into your LC. Good job again!! Do give a hand to the others and leave comments on their LC. Some of them really would benefit from some peer tutoring.** **A question for you: What are some types of instructional strategies within instructional design theories?** **-emm, seems that I just have the surface knowledge of ID. Can't identify what exactly is instructional strategy, will have to do more readings. But in Dr. N class, we have just come into 'Teaching Strategies' topic, thus I wonder if Instructional Strategy is Teaching Strategy? And are these some of the examples of Instructional Strategy? i.e: Collaborative Learning, problem-based learning, etc? really, I have lots more to find out :S-r** **I think I can help you with tis, how am I going to explain? may b in the gwave, ok? I leave notes there ok based on what I understand ok-M** **Great! How do you find the waving experience? What did you learn from each other?** **Hi m, thanks to jumpstart our idle wave, hehehe. I still hasn't grasp the concept of instructional strategies, hope others in the wave will enlighten me too. Miss Foo, waving is an interesting way to share our learning, I prefer gwave more than posting to Moodle as i feel that there I feel more flexible to post without worrying of wrong facts and asking questions etc it also capture more feedback from others compared to if I post in Moodle. It's just that the replies in gwave has no notification, so only if one open it then one can know there's a reply. But i get some active feedback by some of the peers here, so i'm satisfied in using Gwave. Do you wanna join us there?so maybe u can clarify doubts and ambiguity in**

				activities involved in ID process are instructional analysis, instructional strategy and evaluation which are often linked to these 3 questions for an ID to answer: 1. where are we going? - do instructional analysis 2. how will we get there? - develop instructional strategy 3. how we'll know when we get there? - develop and conduct evaluation	analytical skills and sometimes i feel overwhelmed. Furthermore, usually, the time frame for an ID project is very short but the analysis and processes will take lots of time. I wonder how real ID solve this. That, more or less initimidate me to venture in this field coz i am a person who is easily become stresful when time is the constraint.		**our conversation-r** Well, I'm not the source for the answer :) But wouldn't mind looking through your wave history to see what ideas you guys constructed about instructiona strategies and others, may I? Keep in mind there is no absolute answer. As a ID, remember to use CONTEXT to find appropriate solutions. Yup I agree with R, I am just sharing, ya..I my self don't know if I make mistakes or not, hurm...ya...I like waving more than moodle in some part suc as discussion part, I think waving is good for discussion-M

Appendix 16

Extract of Debriefing Transcript

Date: 26/3/2010
Time: 3:35pm – 3:45pm

Topic: Course Debriefing

Context: L1 talking about his/her personal learning experience in class, with course instructors (F1 and F2) facilitating or prompting in-depth explanation.

Participant Info: L1 is the youngest learner in the class, just completed Bachelor Degree in Education. L1 is currently a tutor with a local education institution. L1 appears to be a 'digital native', being totally comfortable with gadgets and technology. From the two surveys, he is conversant with almost of the web technologies listed. L1 is a self-confident learner and would be interesting to find out the responses to the activity systems in the eSCLE.

Speaker	**Statements of an analysis unit**	**Notes**	**Theme / Category**
L1	*I came in erm…initially expecting to learn new things, yeah*	Shows prior perception of teacher-controlled learning environment	Mismatch of expectations
L1	*But this course was different*		Ambiguity
L1	*I mean, we need courage and attitude of know 'how' to be self-directed*	L1 refers to SDL as a procedural activity – 'know how to be self-directed	
L1	*Without content expertise…it slow down the process tremendously and become frustrating.*	Used to being spoon-fed What is the significance of content knowledge in developing self-directed instructional designers?	Process vs Product in learning
F2	*What was your strategy to survive?*	To probe transitional phases	
L1	*I told myself NO negative mindset*		
L1	*Must try very hard to cope with tasks*	SDL is a real-life challenge	Struggle Steep Learning Curve
L1	*Before this, I was always a one-man-show. So…I learn to adapt to groupwork environment..and err…delegate tasks.*		Adapting to transform
L1	*Yeah, we work well as a team. I have learnt groupwork. It*	Able to relate learning	Collaboration

	is important to accomplish tasks as an ID.	experiences to subject matter	
F1	*How did the web technologies help?*		
L1	*I became a self-directed learner by asking, searching, reading the information about the ID on the web.*		Investigation Tool
F1	*Was it individual asking, searching and reading?*	TO probe the socio-constructivist role of web technologies	
L1	*It was both individual learning and sharing of information.*		
L1			

Appendix 17

Moodle as Course Management System

Re: Welcome to the class

by FOO SZE-YENG - Friday, 8 January 2010, 07:42 PM

Dear all,

We are glad to see some of you taking the stage and self-directing the class discussion today. It shows that you're assuming responsibility and motivated to be managers of your own learning.

In this course, you are instructional designers and self-directed adult learners. So let as be reminded to take the INITIATIVE to:
1)diagnose our own learning needs,
2)formulate our own learning goals,
3)identify resources for our learning,
4)choose and implement appropriate learning strategies,
5)evaluate our learning outcomes at all times.

It would be good for all to reflect and share on the ways you self-direct your learning throughout the course. You are encouraged to experiment with the blog space on our class moodle to document your personal learning journey.

Happy Learning!

foo

Show parent | Edit | Split | Delete | Reply

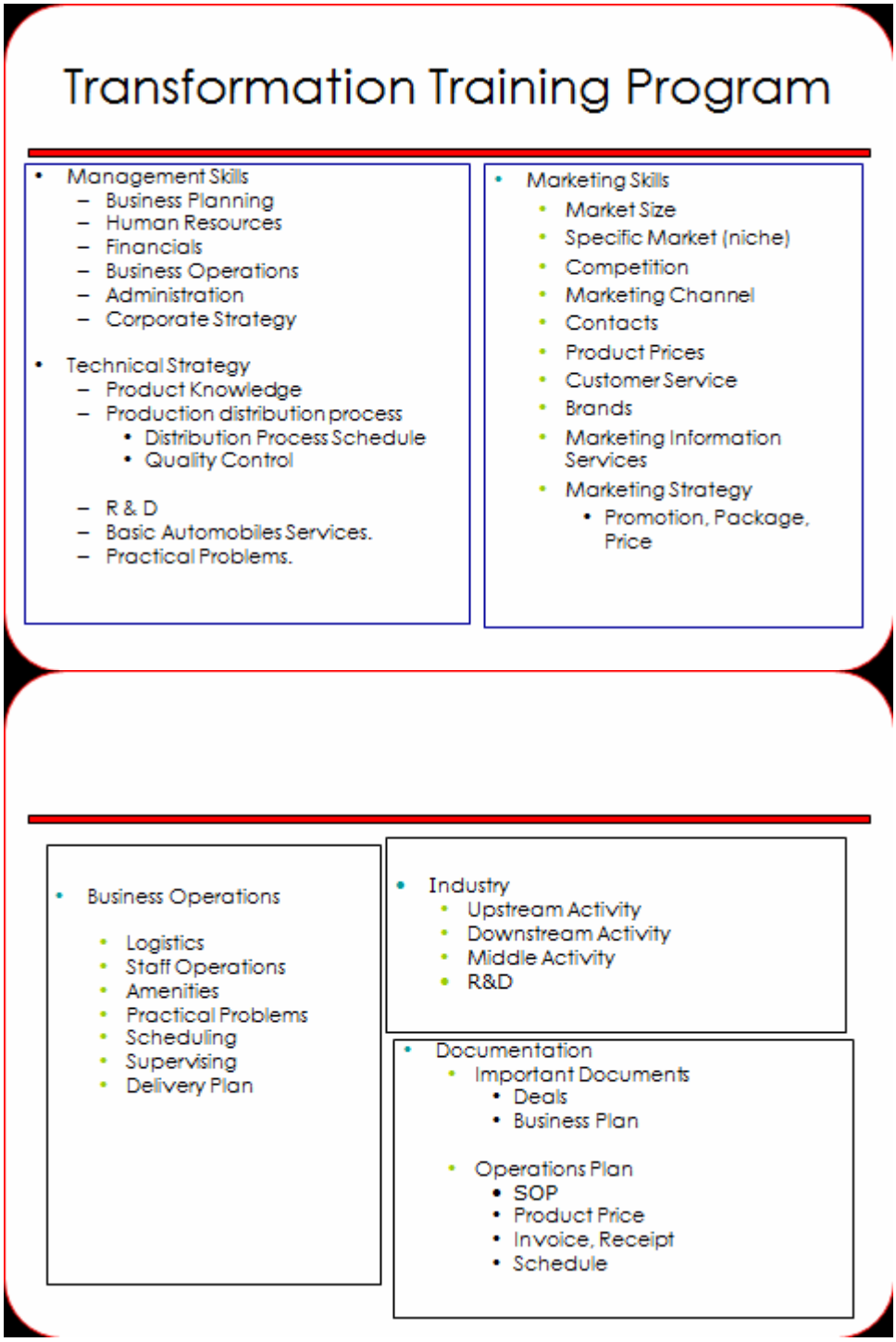
Appendix 18
Real Client for R&D ID Project

Appendix 19
Learning Orientations

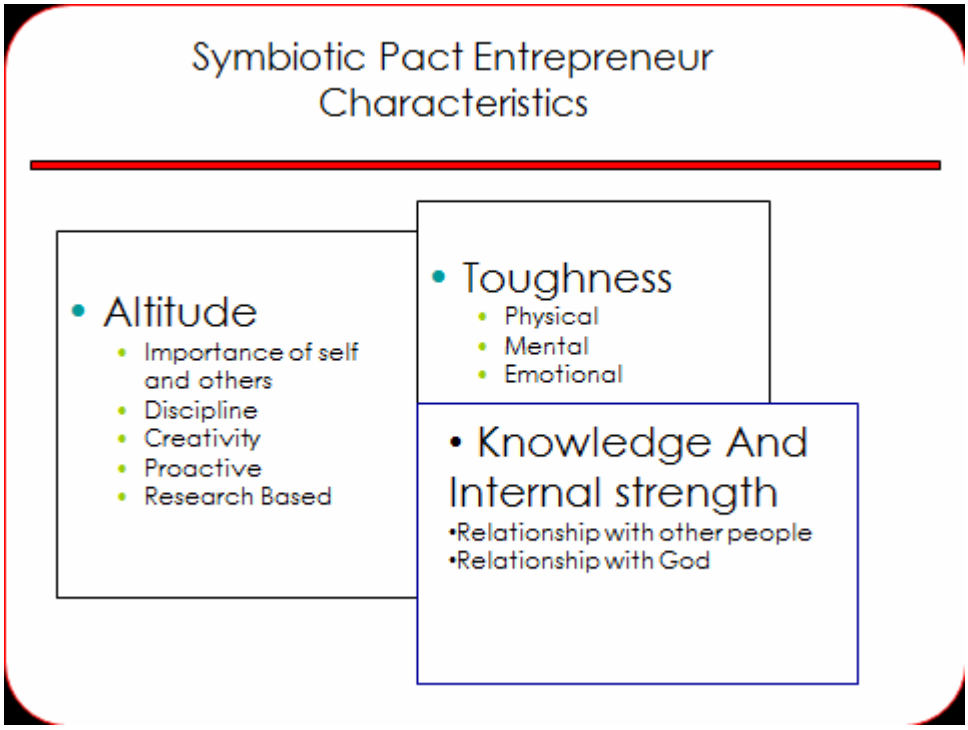
Four Orientation	Emotional/Intentional Aspects	Strategic Planning & Committed Learning Effort	Learning Autonomy
Transforming Learner (Innovation)	A *transforming* learner: Focuses strong passions and intentions on learning. Is an assertive, expert, highly self-motivated learner. Uses exploratory learning to transform to high, personal standards.	A *transforming* learner: Sets and achieves personal short- and long-term challenging goals that may or may not align with goals set by others; maximizes effort to reach important personal goals. Commits great effort to discover, elaborate, and build new knowledge and meaning.	A *transforming* learner: Assumes learning responsibility and self-manages goals, learning, progress, and outcomes. Experiences frustration if restricted or given little learning autonomy.
Performing Learner (Implementor)	A *performing* learner: Focuses emotions/ intentions on learning selectively or situationally. Is self-motivated when the content appeals. Meets above-average group standards only when the goal/benefit appeals.	A *performing* learner: Sets and achieves short-term, task-oriented goals that meet average-to-high standards; situationally minimizes efforts and standards to save time. Will reach assigned or negotiated standards. Selectively commits measured effort to assimilate and use relevant knowledge and meaning.	A *performing* learner: Will situationally assume learning responsibility in areas of interest but willingly gives up control in areas of less interest. Prefers coaching and interaction for achieving goals.
Conforming Learner (Sustainer)	A *conforming* learner: Focuses intentions and emotions cautiously and routinely as directed. Is a low-risk, modestly effective, extrinsically motivated learner. Uses learning to conform to easily achieved group standards.	A *conforming* learner: Follows and tries to achieve simple task-oriented goals assigned and guided by others, then tries to please and conform; maximizes efforts in supportive relationships with safe standards. Commits careful, measured effort to accept and reproduce knowledge to meet external requirements.	A *conforming* learner: Assumes little responsibility, manages learning as little as possible, is compliant, wants continual guidance, and expects reinforcement for achieving short-term goals.
Resistant Learner	Focuses on not cooperating. Is an actively or passively resistant learner. Avoids using learning to achieve academic goals assigned by others.	Considers lower standards, fewer academic goals, conflicting personal goals, or no goals; maximizes or minimizes efforts to resist assigned or expected goals either assertively or passively. Chronically avoids learning (apathetic, frustrated, unable, discouraged, or disobedient).	Assumes responsibility for not meeting goals set by others, sets personal goals that avoid meeting formal learning requirements or expectations.

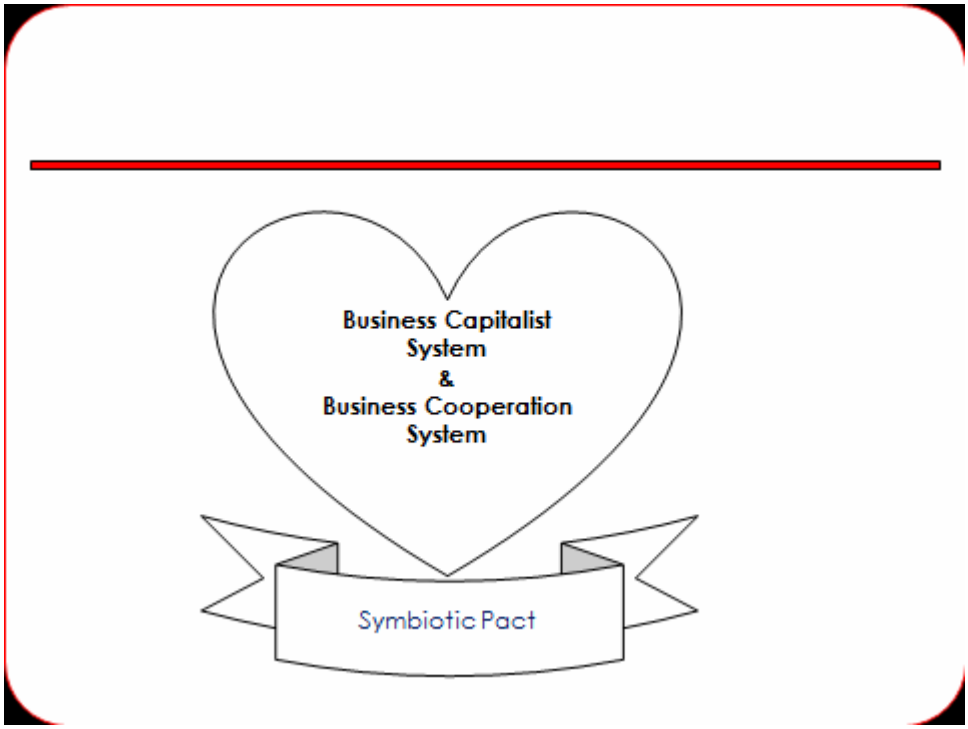
Appendix 20

Background to Transformational Training Programme



(Extract presentation from PUSMAL Director's speech, May 2010)





(Extract presentation from PUSMAL Director's speech, May 2010)

Appendix 21
Group Products in Activity Task 3

Group 1:
Face to Face
Training

Positive Seed Pilot Training Program for Young Entrepreneurs **University of Malaya, Kuala Lumpur**		
Program Outline		
Client	PUSMAL/ Positive Seed	
	Dates	March 20-21, 2010 (Saturday-Sunday)
	Participants	*30 pax*
	Profile	Participants are undergraduate and postgraduate students
	Format	**Basic Training:** 2-days workshop in group work setting (5 groups of 6 pax)
	Venue & Facilities	*IPS Seminar Room AND*
	Mode	*Interactive Lectures and Workshop*
	Organizer	PUSMAL and Positive Seed in collaboration with ADeC and MIT Students
	Trainers	Samir Harith, Encik Ab. Azid Che Ibrahim
	Training Objectives:	
	At the end of the training students are expected to:	

	1. Understand and apply the principles of entrepreneur criteria **2.** Differentiate creative and innovative thinking and apply them into business. **3.** Become a good entrepreneur and promoter in product marketing **4.** Understand and apply the correct design of a Business Plan.

Example of Pilot Training Itinerary (Day 2)

Positive Seed Pilot Training Program for Young Entrepreneurs

University of Malaya, Kuala Lumpur

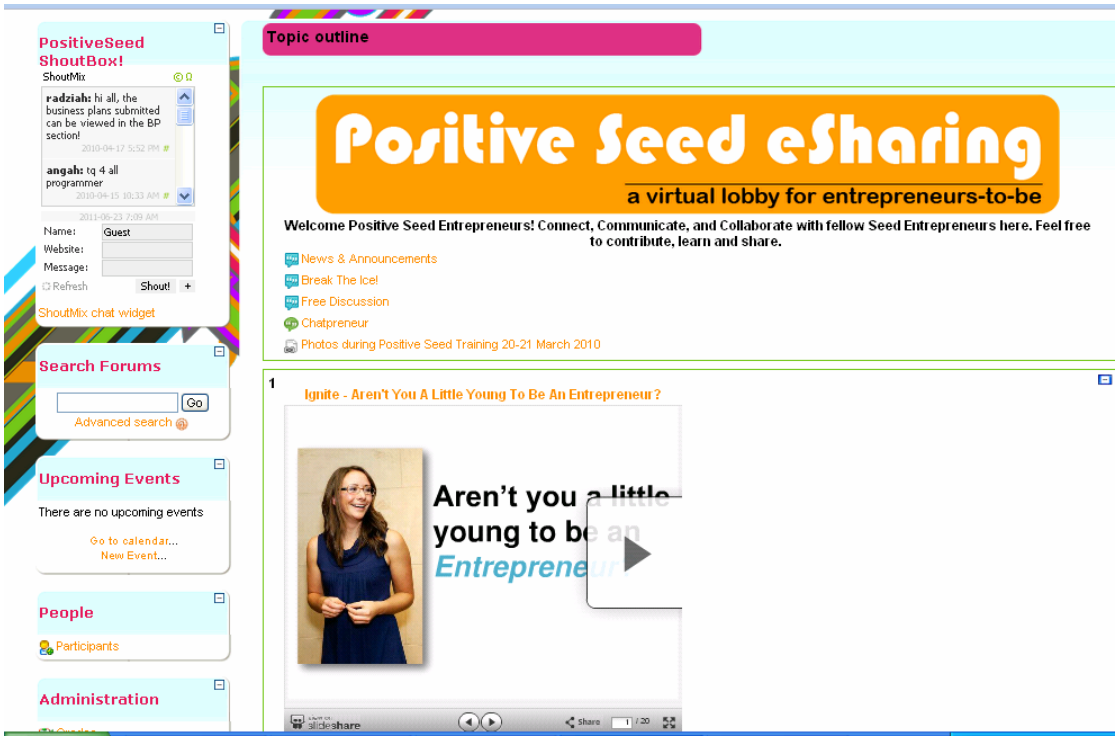
Program Itinerary

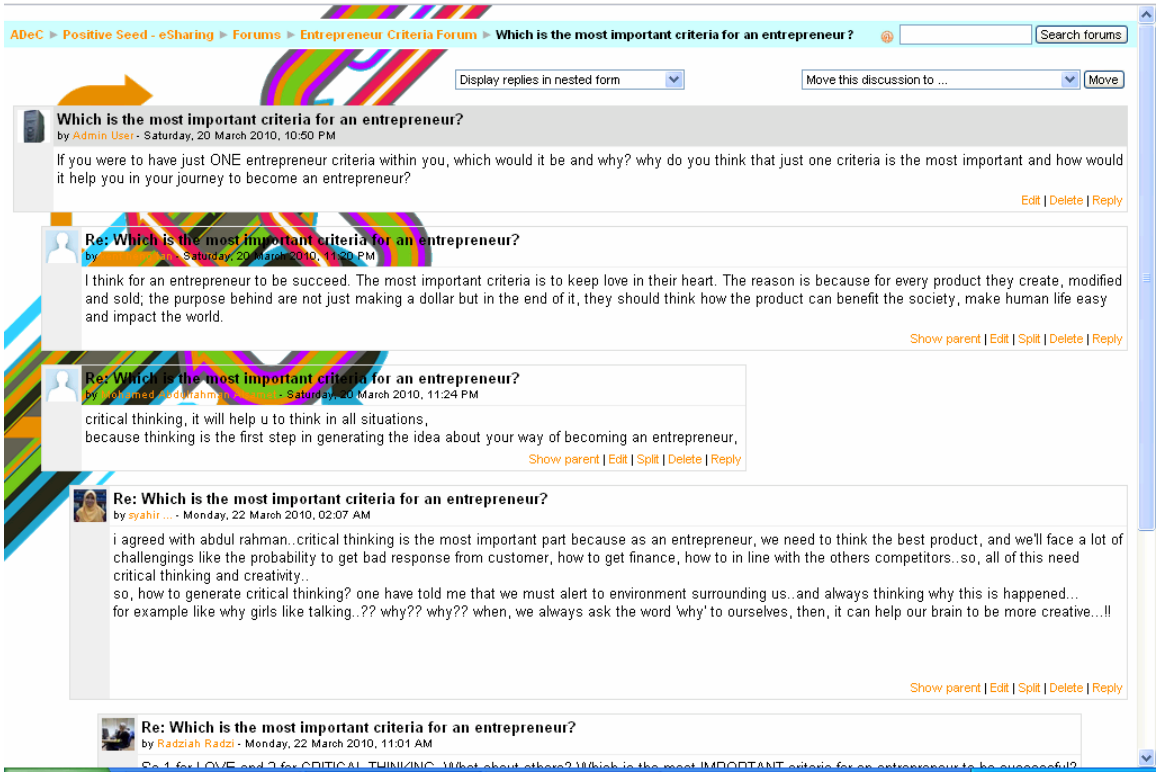
March 20-21, 2010 (Saturday-Sunday)

	Session:	Topics covered:
Sunday	**9.00 am**	**Session 3** **Activity 1 Ice breaking: Selling from a Bag**
		Marketing for Entrepreneur: Interactive Lecture Power Point Presentation
	10.30 am	**Tea Break**
	10.45 am	**Activity 2 Discussion: How to Market your product.** Students will discuss and list the most important aspects that are needed when they market their products.
	11.30 am	**Activity 3 Evaluation:** **Market your product and create your advertisement board.** Students will create the advertisement board to advertise the product they have created in creativity and innovation module.

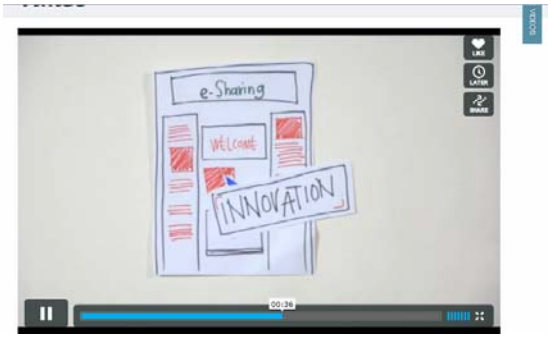
		Closure: Trainer review workshop presentation **Process Questions:** After this session what do you think are the areas do you manage well? What areas need improvements? Which strategies will you implement to improve skills in your place?
	13.00 pm	Lunch Break/ Prayers
	14.00 pm	**Session 4** **Activity 1 Ice breaking: Chain Letter** **Business Plan:** Interactive Lecture Power Point Presentation
		Activity 2: Selling your prototype Think of your invention. You are bringing it to the Young Scientist Fair for display next month.
	15.30 pm	**Tea Break**
	15.45 pm	**Activity 3 Evaluation:** Students will be given a badly designed business plan to analyze and correct by applying the right format and components.
		Closure: Trainer review workshop presentation **Process Questions:** After this session what do you think are the areas do you manage well? What areas need improvements? Which strategies will you implement to improve skills in your place?
	16:45	**Certificates and Closing Ceremony**
	17.00 pm	**End of training**

Group 2: e-Sharing Platform

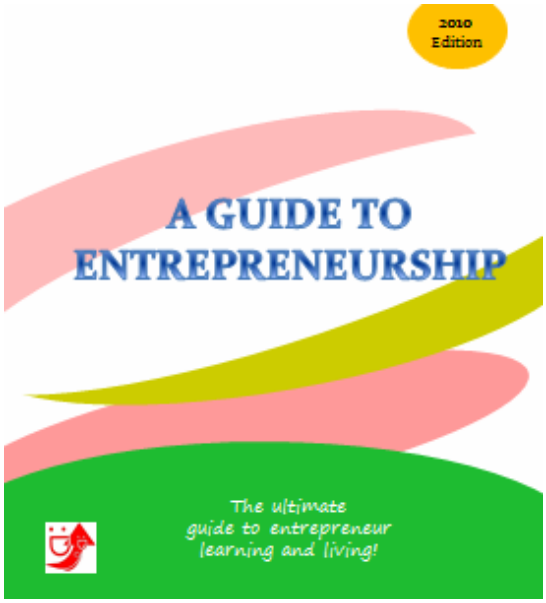




Group 3: Video



Group 4: Guide Book



Appendix 22

Abstracts prepared by the groups for presentation at Symposium

Designing Training to Increase Trainees' Motivation and Knowledge in an Entrepreneurial Workshop

ABSTRACT

The application of theoretical frameworks to design a learning environment is crucial to create learning among learners. The purpose of this paper is to report on the steps taken by students cum novice instructional designers to design, carry out and evaluate training for a real client. A pre-training survey, which aimed to carry out a performance analysis of the trainees, and a post-training survey to find out the feedback of trainees on the training, are used to gauge the success rate of designing training. The findings show that the training was a success but there is still room for improvement. The paper shows that training organised around theoretical frameworks has a higher chance to create a learning environment. Instructional and learning theoretical frameworks can assist teachers or trainers to carry out lessons not through intuition but through systematic steps which allow them to study the kinds of learners and decide on the strategies and methods used to meet the learning outcomes, and energise the learning situation to be more meaningful.

Disseminate the Seed of Transformation: Guide Book Design and Development for Entrepreneurship Training

ABTRACT

This paper highlights how a guide book is developed to convey entrepreneurship concepts to undergraduates, aligned with face-to-face training and an e-learning platform. The objectives of the project are to design and produce a handy guide book which can be brought along any time, providing essential information and inspiration to future young entrepreneurs. The purpose of this paper is to report on how novice instructional designers analyzed, designed, developed and produced a guide book in an authentic environment. Instructional tools such as the ADDIE model (Instructional Design Process) and SWOT Analysis (a strategic planning method) were adopted. Learner analysis was done by interviewing the client, who is familiar with the common temperament of learners. Analysis was done during the face-to-face training to find out more details about learners' characteristics and requirements. Content and graphic designs of the guide book were developed based on the client's requirements and graphic design theories. To assess if the book had any impact on readers, book evaluation was done by questionnaires. The findings show that the book was successful in conveying information but not in graphic and layout design. Restrictions and limitations faced in this project were copyright issues and feedback rate. Only a minimum number of students from one university was involved in evaluating the guide book. The significance of the project is its implication on the crucial need of a detailed and thorough investigation into the different facets of analysis. The value of the project is to suggest that self-assessment of learners is very powerful in inspiring learning.

Designing and Developing a Web-Based Platform To Encourage Collaboration Among Participants in an Entrepreneur Training Program

ABSTRACT

This paper reports on an instructional design project using the ADDIE model to design a web-based platform that is aimed at encouraging collaboration among participants in an Entrepreneur Training Program. The purpose of the web-based platform is to support the face-to-face training with content materials and digital resources and to provide a place for the participants to collaborate. The evaluation is done by a survey and observing participation in collaboration in the online forum. Findings of the study indicate that the participants did not use the web-based platform to collaborate because of limitations during instructional design processes, the limited duration of implementation that led to the missing of the community of practice and the lack of a dedicated administrative team for the web-based platform. The study focused on the instructional design process in designing and developing a web-based platform that encouraged online collaboration and lesson learnt from the instructional design experience. The implications of the study can be used to further improve the instructional design process to develop a good web-based platform for online collaboration. The study also looked into the possibility of using a web-based platform to support any face-to-face training program by collaboration practices.

The Use of Viral Videos to Increase Participation in Entrepreneurial Training

ABSTRACT

This paper in its present form is the result of experimentation on the effects of using viral videos to attract a group of students with specific interests towards the idea of entrepreneurship. The initial idea was to build the image of Positive Seed as 'Hip', 'Vibrant' and 'Fun', with attractive bite-sized ideas of entrepreneur so that they want to find out more. Responses acquired from the group for the first batch of viral videos led to the development of the second batch of viral videos.

The first batch of viral videos was designed in reference to a popular advertisement that used hand gestures and paper cut-outs. The result from the screening of the first batch of the viral videos was a mixture of positive remarks and points for improvement. The second batch of the viral videos was designed using stop-motion techniques, with an element known to be attractive. The videos were then put up online and received attention from various viewers and many positive remarks.

The contributions of this paper are twofold. First, the responses for the first batch of videos showed that the combination of various elements of media in a single video, which was generally thought to be effective, was proven otherwise. Secondly, the effectiveness of the second batch of videos was demonstrated.

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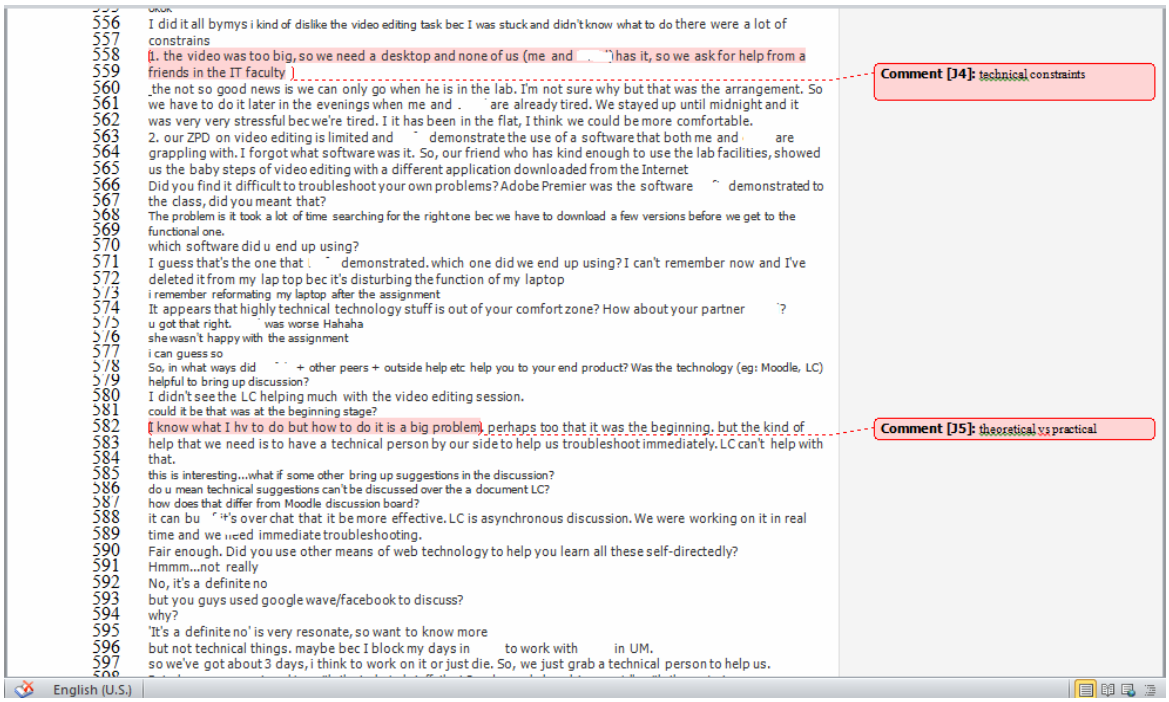
COURSE PROFORMA

Academy/Faculty/Centre Department	Education Curriculum & Instructional Technology
Programme	Masters of Instructional Technology
Course Code Course Title	PXGT 6103 Instructional Design and Development
Course Pre-requisite(s)/ Minimum Requirement(s)	Basic ICT competencies
Student Learning Time (SLT) Credit Hours	121 3.0
Learning Outcomes	1. Describe the roles of instructional design in the field of education and human resource development 2. Apply instructional design processes to solve problems related to teaching and learning 3. Use an instructional design model to design, develop and evaluate a project of own choice 4. Manage an instructional development project
Transferable Skills	1) Communicate effectively and work well with others; 2) Critically analyse research, trends and issues related to the field of instructional technology; 3) Engage in lifelong learning and anticipate the impact that advancements in technology may have on tomorrow's learning; and 4) Develop and market innovative products of learning for diverse audiences and for delivery of instruction within a wide range of settings.

Synopsis of Course Contents	This course introduces students to the basic principles and concepts of instructional design and development as a process to develop alternative strategies to solve problems related to teaching and learning. Topics include: process to identify problems in teaching and learning, which involves needs analysis, learner analysis, task and content analysis, designing and developing alternative strategies and materials to solve problems, and evaluating and managing the whole development process in line with the teaching and learning objectives.
Method of Delivery (lecture, tutorial, workshop, etc)	In-class and online discussions, in-class and online exploration and collaboration.
Assessment Methods Methodologies for Feedback on Performance Criteria in Summative Assessment	1. Participation in class forums and discussions (10 %) 2. Continuous assessment (60%) 3. Exam (30%)

Appendix 24

Extract from Interview Transcript



556 I did it all bymys i kind of dislike the video editing task bec I was stuck and didn't know what to do there were a lot of
557 constrains
558 (1. the video was too big, so we need a desktop and none of us (me and) has it, so we ask for help from a
559 friends in the IT faculty)
560 the not so good news is we can only go when he is in the lab. I'm not sure why but that was the arrangement. So
561 we have to do it later in the evenings when me and are already tired. We stayed up until midnight and it
562 was very very stressful bec we're tired. I it has been in the flat, I think we could be more comfortable.
563 2. our ZPD on video editing is limited and demonstrate the use of a software that both me and are
564 grappling with. I forgot what software was it. So, our friend who has kind enough to use the lab facilities, showed
565 us the baby steps of video editing with a different application downloaded from the Internet
566 Did you find it difficult to troubleshoot your own problems? Adobe Premier was the software demonstrated to
567 the class, did you meant that?
568 The problem is it took a lot of time searching for the right one bec we have to download a few versions before we get to the
569 functional one.
570 which software did u end up using?
571 I guess that's the one that demonstrated. which one did we end up using? I can't remember now and I've
572 deleted it from my lap top bec it's disturbing the function of my laptop
573 i remember reformating my laptop after the assignment
574 It appears that highly technical technology stuff is out of your comfort zone? How about your partner ?
575 u got that right. was worse Hahaha
576 she wasn't happy with the assignment
577 i can guess so
578 So, in what ways did + other peers + outside help etc help you to your end product? Was the technology (eg: Moodle, LC)
579 helpful to bring up discussion?
580 I didn't see the LC helping much with the video editing session.
581 could it be that was at the beginning stage?
582 (I know what I hv to do but how to do it is a big problem), perhaps too that it was the beginning. but the kind of
583 help that we need is to have a technical person by our side to help us troubleshoot immediately. LC can't help with
584 that.
585 this is interesting...what if some other bring up suggestions in the discussion?
586 do u mean technical suggestions can't be discussed over the a document LC?
587 how does that differ from Moodle discussion board?
588 it can bu 's over chat that it be more effective. LC is asynchronous discussion. We were working on it in real
589 time and we need immediate troubleshooting.
590 Fair enough. Did you use other means of web technology to help you learn all these self-directedly?
591 Hmmm...not really
592 No, it's a definite no
593 but you guys used google wave/facebook to discuss?
594 why?
595 'It's a definite no' is very resonate, so want to know more
596 but not technical things. maybe bec I block my days in to work with in UM.
597 so we've got about 3 days, i think to work on it or just die. So, we just grab a technical person to help us.

Comment [J4]: technical constraints

Comment [J5]: theoretical vs practical

English (U.S.)

Appendix 25

Extract of Categories and Codes that Emerged from Constant Comparison Analysis

Interview Transcript	Observation Field Note	Debriefing Transcript
Category 1: Need Guidance *Codes:* *Fear* *Stuck* *Trial and error* *Support Resources* *No Answer* **Category 2: Need Option** *Codes:* *Choice* *Opinion* *Preference* *In control* **Category 3: Feel Tension** *Codes:* *Overwhelmed* *Frustrating* *Differences* *Lost* *Torn between* *Shocked* **Category 4: Feel Challenged** *Codes:* *Capable* *Positive* *Coping* *Learning Process* *Experience* *Adapt*	**Category 1: Teacher as Motivator** *Codes:* *Survey* *Aware(ness)* *Encourage* **Category 2: Teacher as Facilitator** *Codes:* *Guide* *Support* *Scaffold* **Category 3: Learners as Performer** *Codes:* *Presentation* *Acting* *Brainstorming* *Report* *Confidence* **Category 4: Learners as Peer Mentor** *Codes:* *Teach* *Share* *Inquire* *Think* **Category 5: Web Tools as Resource** *Codes:* *Investigate* *Find out* *Explore* *Click* **Category 6: Web Tools as Participation** *Codes:* *Interact* *Share* *Discuss* *Post* *Comment*	**Category 1: Novelty** *Codes:* *Unknown* *Prior knowledge* *Encounter* *Exciting* *Transform* *Knowledge* *Skill* **Category 2: Accountability** *Codes:* *Reflection* *Evaluation* *Feedback* *Tasks* *Dateline* *Goal* **Category 3: Complexity** *Codes:* *Structure* *Struggle* *Problem* *Chaos* *Difficult* **Category 4: Authenticity** *Codes:* *Real-life* *Community-based* *Multiple perspective* *Team-work* *Collaboration* *Work together*