Empowering Lifelong Learning Through the Merging of TELE Models and Design

RESEARCH PLAN

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Abstract

There are few Technology Enhanced Learning Environments (TELE) that support Self-Regulated Learning (SRL) through the use of a Personal Learning Environment (PLE) for students both inside and outside of an institutional context and none which fully realize its potential. In this research proposal I will explore the possibilities of a responsive open learning environment where PLEs, Learning Management Systems (LMS), and knowledge archival fit together within a clean, user-friendly design that empowers the learner in personal and lifelong learning. I will do this by outlining the problems associated with current TELEs, giving a summary of the current research and state of technology, proposing a solution through the design of a new comprehensive TELE, and proposing a research plan to support the design and desired outcomes.

Keywords: TELEs, PLEs, SRL,

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I. Introduction

If knowledge is power then the information revolution has just ushered in the most powerful era in history. But just as a thunder storm has no benefit for our cities and devices, raw information cannot be utilized by learners unless harnessed into knowledge. Students and lifelong learners have unprecedented access to high quality education materials and yet the implementation of contemporary learning models has lagged behind, and cannot facilitate such mass amounts of information.

For years students have been subjected to an instructional paradigm which encourages passivity from students (C. Ellis & Folley, 2010). Promotion is based on seat time rather than skill or knowledge mastery and students may lack motivation due to this mo. In today's knowledge community, this passive environment will not do. Learners must become curators for their own curriculums, and then develop their own strategies to commit these curriculums to memory. As Dochy et al. (2007)put it in the research anthology, Rethinking Assessment in Higher Education: Learning for the longer term, "today's knowledge community expects graduates not only to have a specific knowledge base but to be able to apply this knowledge to solve complex problems in an efficient way' (p. 87).

In place of the former passive model of education, a new learning environment is emerging. In his book "What Would Google Do?" Jarvis (2009) describes his hopes for a new system in light of the information age.

> I imagine a new educational ecology where learners may take courses from anywhere and instructors may select any learners, where courses are collaborative and public, where creativity is nurtured as Google nurtures it, where making mistakes well is valued over sameness and safety, where education continues long past age 21, where tests and degrees matter less than one's own portfolio of work, where the gift economy may turn anyone with knowledge into teachers, where the skills of research and reasoning and scepticism are valued over the skills of memorization and calculation, and where universities teach an abundance of knowledge to those who want it rather than manage a scarcity of seats in a class (p. 210).

Although Jarvis described his views as possibly utopian, there have been many recent cases of increased excitement and initiative to make it a reality (eg. Khan Accademy[1], Udacity[2]).

In order to succeed in such an open learning paradigm, it is imperative that students become self-regulated learners (Ellis & Folley, 2010; Richardson, 2006; Warlick, 2005). Self-regulated learning (SRL) is "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment" (Pilling-Cormick, 2010; Tung & Chin, 2010). In the past two decades, SRL has been the object of numerous studies (Fuente & Lozano, 2010) and in addition to allowing students to expand their sources of knowledge, it has been found to produce increased student productivity, motivation, student retention rates, and metacognitive skills (Ellis, 1994).

Of course, SRL can be built without the aid of technology, but in a world where information continually grows and updates, technology has proven to be a very useful and effective way of managing learning content and encouraging SRL (Bernacki, Aguilar, & Byrnes, 2010; Hadwin, Winne, & Nesbit, 2005; Harris, Linder, & Piña, 2010; Nussbaumer, Albert, & Kirschenmann, 2011; Olakanmi, Blake, & Scanlon, 2010). Many styles of Technology Enhanced Learning Environments (TELE) have already been developed to help teachers distribute information and track progress. Listed below are some examples of basic TELEs.

- **A learning management system (LMS)** is primarily used for education administrators and does not frequently support individual learner freedom. It is a software application for the administration and delivery, recording, tracking, and reporting of e-learning programs and content including training programs, classroom and online events, e-learning programs, and training content (Green, 2007).
- A **learning content management system (LCMS)** is content-centric and is focused on the development, management, and publishing of the content. It allows teachers to create, manage and deliver their courses to students, usually within an LMS.
- A **virtual learning environment (VLE)** is an education system on the web that models real-world education by merging a set of equivalent virtual concepts for homework, tests, classes, classrooms, ...etc. It may include LCMSs and LMSs but may also include the virtual meeting of students and

1 www.khanacademy.com
2 www.udacity.com

teachers through a synchronous web-based application (eg. Skype, Second Life).

It hasn't been till recent years that some SRL concepts have made their way into modern TELEs, and the focus has begun to shift from instructor and teacher based environments to individualized learner centered environments, also known as a **Personal Learning Environment (PLE)**. PLEs are systems that help learners take control of and manage their own learning. This includes providing support for learners to: set their own learning goals, manage their learning (through both content and process), and communicate with others in the process of learning (van Harmelen, 2008). While many institutions are developing TELEs to encourage SRL through the use of a PLE, there are few which support such development for students both inside and outside of an institutional context and none which fully realize its potential.

In this research proposal I will support the exploration of a responsive open learning environment where PLEs, LMSs, and knowledge archival fit together within a clean, user-friendly design that empowers the learner in personal and lifelong learning. I will do this by outlining the problems associated with current TELEs, giving a summary of the current research and state of technology, proposing a solution through the design of a new comprehensive TELE, and proposing a research plan to support the design and desired outcomes.

II. Problem

Limited Control in TELE

Limited control within TELEs makes SRL difficult (C. Ellis & Folley, 2010; Jane Pilling-Cormick, 2010). Personal learners need to be able to model and actively shape their own learning activities and their specific environments to be successful (Fiedler & Väljataga, 2011). When we recognize that the technology limitations or design of many TELEs can actually hinder learning through lack of control, it becomes imperative to use technology to give learners an appropriate level of control. At the same time, too much control can have a detrimental effect on users who do not possess the skills to manage it.

Lack of User SRL Capabilities

Many students often lack the SRL skills that are needed to be successful in reaching their goals in a TELE (Harris et al., 2010; Proske, Narciss, & Körndle, 2010). Even if their Information Communication Technology (ICT) skills are exceptionally high, it may not be enough to regulate their own learning within a PLE (Deepwell & Malik, 2008). SRL is being developed in many education institutions now, but there needs to be a support system that aids not only students of all ages but also life-long learners that may be unable to attend a physical school.

Difficulties in Procuring Appropriate Tools and Content for PLEs

It is difficult to procure the most appropriate tools and content in an ever growing and updating environment such as the internet. Search engines have been developed to help locate sources but have not yet been customized to learning content or particular learner needs. Course aggregators or tutorial systems such as Udemy[3], Khan Academy, The Great Courses[4], and Lynda.com[5] help index quality instruction but one still needs to have foreknowledge of such sites and access them individually to search content. While many LCMSs and VLEs try to recommend appropriate content and tools, they often end up limiting access to users, tools, and content based on their own repositories instead of utilizing the plethora of quality resources from around the world.

Tools and Resources Divided Across Various Learning Environments

Learning environments have been developed to solve particular aspects of learner needs, see chart 1, but have not yet been completely aggregated into one interactive environment. Although these environments help learners and educators in important ways, if a user has low SRL skills it may be difficult to coordinate these different environments in order to develop their own learning plan.

3. www.udemy.com
4. www.thegreatcourses.com
5. www.lynda.com

TELEs often do not Support Lifelong Learning

Learning, in the sense of the acquisition of knowledge or skills, is only part of receiving an education. As Richardson (2006) indicates, learners will need to know how to manage the information that they consume. Learners will be required to collect, store, and retrieve relevant information throughout their lives and they need the skills to do so effectively and efficiently (399). However, most TELEs created within an institution only support the skills for learning new content. Once a user leaves the institution, or a course ends, their learning environment is often suspended. This does not support lifelong learning.

III. Literature Review

The literature review will provide a sampling of the current research conducted to provide a background for my research questions and hypotheses. This will include the role and state of SRL, PLEs, and Design within TELEs.

SRL in TELE

It was previously stated that there is a great need for SRL in today's society. As a response, there has been a great deal of research supporting the need for SRL within TELEs (Ellis & Folley, 2010; Harris et al., 2010; Kauffman, 2004; Olakanmi et al., 2010; Vighnarajah, Wong & Bakar, 2010)[6]. TELEs cause learners to acquire more knowledge than environments without technology (Bernacki et al., 2010). Yet, the nature of technology and the mountains of information it presents calls for established or guided SRL aid. 'Some students may not even be able to start learning activities on their own as the "mountain of information" can be perceived as an insurmountable task' (Narciss, Proske, & Körndle, 2007, as cited in Proske et al., 2010 p. 316).

SRL Environments

Several environments have been proven to benefit from SRL skills and aid in TELEs. In an analysis of 55 SRL related studies Bernacki et al., (2011) found that learners who engage in SRL behaviors are far more likely to be successful than learners who do not engage in SRL behaviors in the following environments: (a) which are focused on complex, multi-step tasks in which possible solution strategies and outcomes are not known in advance (so the learner must plan and monitor performance), (b) where it is easy for the learner to become distracted, lose interest, or forget the main goals of the task, (c) where the task requires the use of strategies (e.g., note-taking) to overcome the processing limitations of the mind, and (d) when learners must engage in helpful behaviors (e.g., planning, monitoring, strategy use, etc.) on their own, without guidance, pressure, or prompting from others. Where this criteria is not found in all learning environments, it can be stated that many SRL skills would greatly benefit from a TELE. The following studies show specific instances where SRL aide was or could be deemed both possible and helpful: science topics (Olakanmi et al., 2010), distance language learning (Andrade & Bunker, 2010), Web 2.0 tools (Lizarraga, Villanueva, & Baquedano, 2010), reading comprehension (McMahon, 2010).

Measuring SRL

The following methods have been established to measure SRL:

1. Motivated Strategies for Learning Questionnaire (MSLQ): measures learning strategies and motivation based on an 81-item questionnaire with a 7-point format ranging from "not at all true of me" to "very true of me" (Pintrich, Smith, Garcia, & Mckeachie, 1993).

2. Learning and Study Strategies Inventory (LASSI): measures concentration, time management, self-testing and study aids based on a 10-scale, 80-item assessment (Weinstein, Schulte, & Palmer, 1987).

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6. This need is characterized by a) the inability of the instructor to receive and process non-verbal cues indicating that the learner may not be understanding or may be having problems, b) the necessity for learners to inform their instructors when they are experiencing difficulties, c) the difficulty of initiating and maintaining social interaction between learners, and d) the managing of busy schedules to include sufficient time for course activities and assignments (Harris, Piña & Lindner, 2002 as cited in Harris, Linder, & Piña, 2010).

3. Online Self-regulated Learning Questionnaire (OSLQ): 24-item questionnaire with a fivepoint Likert-type style response format (Barnard, et al., 2009).

The State of PLEs within TELEs

As users realize the growing need to organize their own learning environment, they currently have few options. This may have resulted from the lack of consensus on what a PLE might be. Attwell (2007) reported his experience from the The Association of Learning Technology's 2006 conference: "The only thing most people seemed to agree on was that it was not a software application. Instead it was more of a new approach to using technologies for learning…" (p. 1). Even now, there seems to be little consensus (Fiedler & Väljataga, 2011). However, the need to organize educational materials remains. Perhaps this is why we saw an initial rise in the "one-size-fits-all" LMSs or the slightly better LCMSs but not in PLEs. The top goal of PLEs, giving the user autonomy and control rather than prepackaged learning resources, was not present in these early TELEs. Since then we have started to see the emergence of a few tools that imply the beginning of a software or web based PLE.

Mashup interfaces allow for the aggregation of tools or apps, also known as widgets, in order to make a personalized space for learning resources. Examples of mashups can be seen with igoogle[7] or the dashboard interface on most personal computers. While providing a useful link to various tools and information, these spaces do not often contain pedagogical support. Semantic Mash-up Personal and Pervasive Learning Environments (SMupple) have since been proposed. SMupple would put users/learners onto centre stage and provide them with "intelligent" guidance, support, and awareness through non-invasive adaptation mechanisms in order to support the users/learners in developing their own SRL skills (Soylu, Mödritscher, & Causmaecker, 2010).

In addition to mashup technologies we are starting to see various recommendation tools that suggest learning materials based on a variety of sources including an additional layer of metadata gathered through algorithms compiling information from various sources. Examples include the Federated Search and Collaborative Recommendations which makes use of the usage of resources by people, the Community-based PLE recommender which integrates a pattern repository into existing PLE solutions so users can voluntarily share their PLE usage experiences as 'good practices' with peers, and lastly psycho-pedagogical recommenders which combines theoretical models and relevant taxonomies with user data in order to provide feedback in SRL situations (Mödritscher & Krumay, 2011). Mödritscher and Krumay report that these tools provide learners with the resources to formulate concrete learning goals and needs, gather learning resources, and find relevant peers among other things.

ROLE

The best known innovational PLE initiative can be seen through the European project ROLE (Responsive Open Learning Environments). They strive to empower learners for personalized and lifelong learning within a responsive open learning environment. ROLE is advancing the latest innovations in "human resource management; self-regulated and social learning; psycho-pedagogical theories of adaptive education and educational psychology; service composition and orchestration; and the use of ICT in lifelong learning ("About ROLE, 2012)." The site objective page states:

> For the learner and teacher, the ROLE infrastructure enables for the first time a truly learner-centered PLE. The ROLE infrastructure will empower the user for true lifelong learning across institutional boundaries. The integration of learning with other parts of the learner's social life will be considerably facilitated, thus increasing motivation for and effectiveness of learning. The ROLE learning services and tools will create new opportunities for collaborative learning and learning communities as well for emerging markets ("ROLE Objectives," 2012).

ROLE provides an excellent resource for researchers interested in the development of personal responsive learning environments. They have many research and application contributors and although they do not currently have a PLE fully integrated with design initiatives, their objectives (see chart 1) suggest that they may develop one in the near future.

7 www.google.com/ig

Importance of Design

Effective design is imperative to the success of an effective PLE. Latchem & Jung (2010) state "... whatever technology or mix of technology is used, this only becomes truly effective when it is combined with innovative and effective instructional design." By implementing design theories and testing into this research, it will help ensure that learners are able to fully utilize the environment that accentuates options without becoming overwhelmed by methodology or options. This is a common problem in many early models. As Proske et al. (2010) found in their study on the TELE known as Studierplatz that while many TELEs provide tools supporting SRL, few students use them meaningfully with only 20% of students used the learning plan tool when instructed to create a PLE. The study of information design, instructional design and semantic web engineering will greatly aid in the production of an effective PLE.

Design-based-research (DBR) was selected as an eventual means of testing the environment because of the complex system involving emergent properties while providing a testbed for innovation. DBR is "pragmatic as well as theoretical in orientation in that the study of function - both of the design and of the resulting ecology of learning – is at the heart of the methodology" (Cobb et al., 2003, p. 9).

SRL basic phases to be supported: (Zimmerman, 2002):

1. forethought phase (e. g. goal setting, planning …)
2. the performance phase (e.g. self-observation processes)
3. self- reflection phase (e.g. self-reflection processes)

PLE: Personal Learning Environment basic goals (van Harmelen, 2008)**:**

1. set their own learning goals
2. manage their learning, both content and process
3. communicate with others in the process of learning

LMS Learning Management System (Ellis, 2009):

1. centralize and automate administration
2. use self-service and self-guided services
3. assemble and deliver learning content rapidly
4. consolidate training initiatives on a scalable web-based platform
5. support portability and standards
6. personalize content and enable knowledge reuse

ROLE Principle Goals ("ROLE Objectives," 2012)**:**

1. guidance and freedom (depending on the learners self-regulated learning skills, the learner can rather act freely or get guidance (recommendation from ROLE)
2. motivation (using a self- regulated approach should lead to intrinsic motivation of a learner)
3. meta-cognition and awareness (selecting learning resources and getting feedback should stimulate meta-cognition of a learner)
4. collaboration and good practice sharing and
5. personalisation (recommendation based on the learners' profile data (e.g. preferences) leads to personalization)

Chart 1: Goals of TELEs

IV. Purpose of the Study

General objective*:* The purpose of this study is to design and start building a responsive open learning environment (ROLE) in which PLEs, LMSs, and knowledge archival fit together within a clean, user-friendly design that does not overwhelm the user but instead supports him or her in both the development of SRL and recommendation of content and tools.

Research objectives*:* My research will include tracking past and future TELEs, analyzing technology, educational psychology, and design research in order to design, develop and test the proposed TELE.

Specific program objectives*:*

1. meet the standards and goals of all learning platforms (see chart 1)
2. be usable in any context of learning by any user
3. present platform and information in clear and concise way with no ambiguity to achieve straightforward navigation
4. recommendation tools: use learning recommendations based on reputation schemes and collaborative filtering techniques.

V. Research Questions & Hypotheses

Qualitative Questions:

1. What design strategies can be devised to create a responsive open learning environment (ROLE) in which PLEs, LMSs, and knowledge archival fit together within a clean, user-friendly framework that does not overwhelm the user but instead supports him or her in both the development of SRL and recommendation of content and tools?

2. How can current learning and design theories and technologies support the development of such an environment?

Quantitative Hypothesis:

Hypothesis 1: If the proposed learning environment or platform can be developed, then its active use will lead to an increase in self-regulated learning, engagement, and content retention.

Hypothesis 2: A ROLE created combining all learning environments would be more effective in increasing learner motivation and content retention than one created using separate modules.

VI. Methodology

The execution of this project will take place in steps within the working period as a way to best validate, monitor, design, develop, and test the the PLE proposed thus proving or disproving Hypothesis 1. The phases include the following:

Research

1. Track Developing Models and Programs: covers the maintenance of a database organizing the existing and developing learning models pertinent to TELE, ICT, VLE, PLEs, LCMSs, and learning tools, widgets, and sites.

2. Further analyze European collaborative project: ROLE

3. Technology Research: covers a deeper research regarding the available and developing technologies related to the feasibility of proposed learning platform. Basics of each element will be achieved to comprehend capabilities of listed technologies as well as improve understanding of backend to learning platform design.

3.1 Search Engine Development (Udacity Course CS101: Building a Search Engine)
3.2 Software Development Process (Udacity Course CS212: Design of Computer Programs)
3.3 Web Application Engineering (Udemy Course CS253: Web Application Engineering)
3.4 PHP (Lynda course: PHP with MySQL Essential Training)
3.5 MySQL (Udacity Course: MySQL Database for Beginners)

3.6 Apache
3.7 Linux
3.8 Folksonomy & Recommendations
3.9 iOS Development (Lynda course: iOS Essential Training (2012)

4. Learning Theories Bibliographical Revision: In this phase, I intend to study the main references involving learning theories with a particular focus in those whose theories and models impact virtual learning environments. The main tenants will be implemented into the design of the program as well as summarized in the final report supporting said program design.

4.1 Basic Learning Theories: I will study the following theories and theorists within the realm of learning psychology taking note of relevance to program design: Neuroscience of Learning, Behaviorism, Social Cognitive Theory, Information Processing Theory, Constructivism, Cognitive Learning Processes, Motivation, Self-Regulation, Development (Dewey, Piaget, Bruner, Knowles, and Vygotsky).
4.2 Learning Theories to be studied in depth: Self-Regulated Learning, Self-Directed Learning, Metacognition, Self-Efficacy, Multiple Intelligences, Learning Styles and Memory Theories.
4.3 E-learning Theories and Subjects: Game Studies, Virtual Learning Environments, Intelligent Tutoring, e-Portfolios, Quality Assurance, Student Information Systems, Communities of Practice, Learner, Memory Extenders

5. Design Research: covers the research related to usability and interface design. This will be done to ensure a user-friendly design that encourages a good self-regulated learning model.

5.1 Information design
5.2 Multimedia theory
5.3 Instructional design (Aptitude-treatment interaction, message design, personalized learning models, interface design, etc…)
5.4 Adaptive Interactive Systems
5.5 Semantic Web Engineering
5.6 Ontology Engineering
5.7 Information Science

Design

6. Design and Development of Learning Platform: covers the design of interface and backend.

6.1 Research further user desires and platform needs.
6.2 Several designs of interface and desired tools will be created based on learning theory, information design and technology research.
6.3 Design of functional backend for prototypes.
6.4 Implementation of visual web environment pilots.
6.5 Create several pilot with limited course creation functionality platform.
6.6 Develop design based on usability testing.

Test & Report

7. Testing and Revision: set of tests and validation of results will be realized aiming to validate usability and success of learning platform. Full platform will not be tested at this stage.

7.1 Research best practices in usability testing within learning contexts.

7.2 Usability Testing: Implement usability quality components of Jakob Nielsen (Nielsen, 1993), or similar model such as System Usability Scale (SUS) the (Brooke, 1996), to test learnability, efficiency, memorability, errors, and satisfaction will be applied to program design.

Sampling: Nielsen's protocol involves doing small sample groups of 5 users. Problems are identified, fixed, and then another round of testing is implemented. I would do several round of testing on different sample groups. Ex. foreign university students, English speaking university

students, geriatric group, and elementary students. This will not represent an adequate sample of the survey population, but will provide needed feedback for program development. Informed consent will be obtained, and anonymity will be ensured.

Instrumentation:

Focus group: list of questions will be developed regarding program's organization, content, design, usability … etc. Focus groups will be asked to discuss issues and what they like and don't like.

Protocol analysis: one-on-one interview methods will be used in combination with think-aloud protocol in order to obtain usability information.

Quantitative: Compare success rates and time required of users on specific tasks with different prototypes.

Data Analysis: results of mixed results (both quantitative and qualitative) will be analyzed to create list of usability problems.

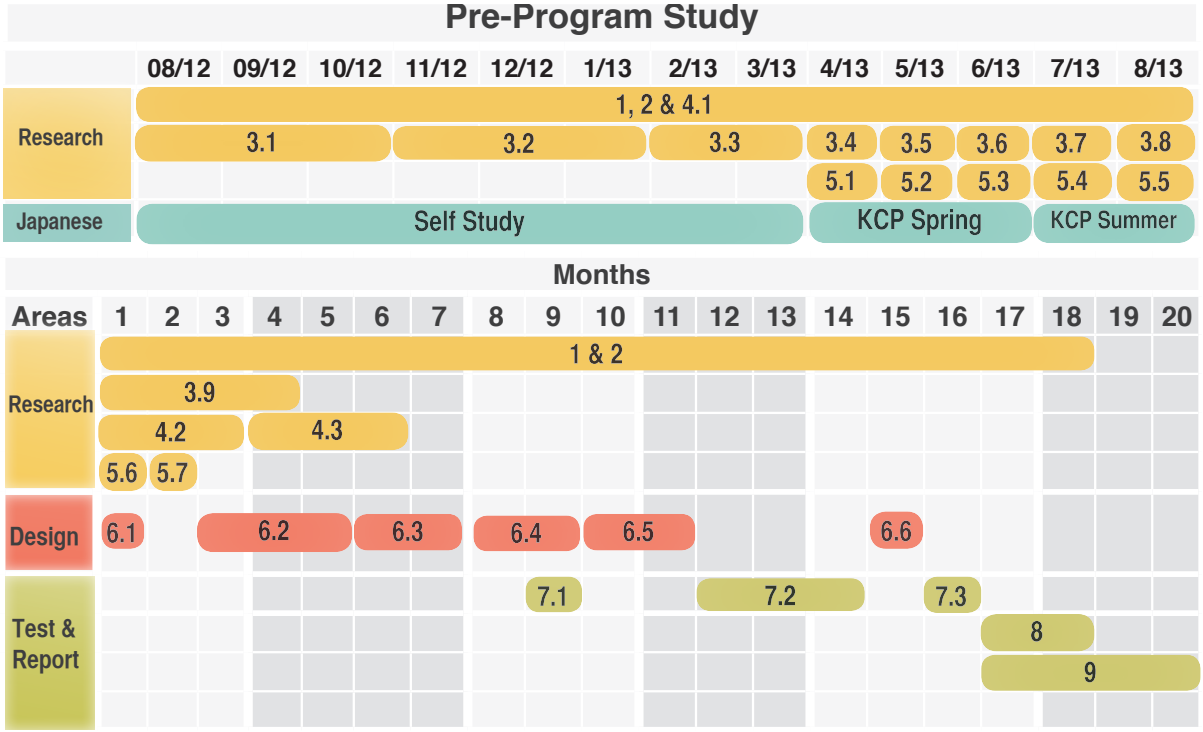
7.3 Revision: Best prototype will be revised based on problems discovered in testing.

8. Analysis of Design: List of widely accepted learning, usability, and function objectives for ROLEs, SRL, PLEs, LMSs, and knowledge archival will be compiled. Platform will be analyzed based on user analysis/ survey of experts in education.

9. Development of Report: based on the evaluation of results as well as a summary of the research of proposed design a final research report will be developed.

VII. Chronogram

According to the steps presented in the methodological procedures, the time duration of this project, designed for 20 months, is established in the following chronogram:



ICU Graduate Courses

Autumn 2013	Winter 2013	Spring 2014	Autumn 2014	Winter 2014	Spring 2014
JLP J3/J4: Japanese 3/4	JLP I2: Intensive Japanese 2 *or* JLP J4/J5: Japanese 4/5	JLP I3: Intensive Japanese 3 *or* JLP J5/J6: Japanese 5/6	JLP A1: Advanced Japanese 1 *or* JLP J6: Japanese 6	JLP A2: Advanced Japanese 2 *or* JLP A1: Advanced Japanese 1	JLP A3: Advanced Japanese 3 *or* JLP A2: Advanced Japanese 2
QALL401: Computing for Researchers	QALL403: Writing for Researchers (English)	QEMR601: Research I	QEMR602: Research II	QEMR603: Research III	QEMR604: Research IV
QEFD409: Seminar in Mind and Brain	QEED508: Research Design in Education	EMS101: Computer Application in Education	QEPS506: Human Information Processing	QEED505: Comparative Studies of Educational Reforms	QEFD407: Perspectives on Distance Education and Media Use in Education
QCFD415: Methods in Comparative Culture	QEED511: Seminar in Literacy and Non-formal Education	MCC275: Technology and	QEPS507: Language Development	QEED508: Research Design in Education	QEED515: Studies in Multicultural Education
QELE502: English Linguistics	QELE501: Bilingualism and Bilingual Education	PSY241: Psychology of Learning, Memory and Cognition		QELE506: LanguageAcquisition	QEFD406 International Comparative Education

**Note: Courses are based on 2011/2012 academic calendar and are subject to change.*

VIII. Demarcation of the Terrain of Study

Limitations

1. Learning platform will not be fully developed within scope of proposed time due to personal programming limitations and lack of current monetary funds.

2. Hypothesis 2 cannot be tested in this stage of research. Once program is fully implemented then tests regarding the increase in learner's self-regulated learning, engagement, and content retention can be carried out.

3. Specific content and tool metadata created by program users cannot be developed for the use of recommendations until the program has been active. Some data can be pulled in from existing metadata until this is achieved.

Delimitation

1. Testing has been limited to usability analysis due to time allowances. With the full proposed learning 2. platforms research involving such issues as, but not limited to, cultural usability variances, and increased SRL, are possible at a later time.

3. Usability testing will not represent an adequate sample of the survey population due to monetary and time limitations, but will provide needed feedback for program development.

4. Breadth of learning platform features will not be delimited to encourage maximum capabilities and interconnectivity of learning tools and resources.

5. Development of platform will initially focus on customizable PLE and SRL prompts to assure a good program base. Other elements may be added at a later time.

6. While area of study is broad at this point, narrowing of topic will likely occur as research continues.

IX. Contributions

1. An inclusive responsive open learning environment with exemplary design would:

2. Improve the ease in which users can access relevant content and tools including customized recommendations based on user needs

3. Improve learner ability to self-regulate their learning

4. Provide an open source for users around the world to organize their learning plan

5. Provide an integrated environment for coaches, teachers, and parents to track and monitor student progress

6. Increase well designed tool and content pervasiveness through rating system

7. Help organize learning materials in meaningful ways for later use

8. Establish easy way for teachers to provide courses to students and users around the world

9. Provide way to organize and schedule any project

10. Provide teachers with tools to create course foundations as rigid or open as needed depending on students level and comfort level

11. Grow and change with evolving technology and content

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