Language Acquisition Sustainment Expert System (LASES)

Design Proposal

Shawn N. Kumagai

California State University – Monterey Bay

IST522 Instructional Design

Professor Rosalie Strong

December 14, 2012
# Table of Contents

Executive Summary .................................................................................................................. 3  
Background ............................................................................................................................... 3  
Project Goal .............................................................................................................................. 3  
Considerations and Constraints .............................................................................................. 3  
Estimated Timeline and Costs ................................................................................................. 4  
Analysis .................................................................................................................................... 4  
Organizational Analysis .......................................................................................................... 4  
Learner Analysis ....................................................................................................................... 6  
Solution Description ............................................................................................................... 7  
Proposed Solution .................................................................................................................... 7  
Product Objectives .................................................................................................................. 8  
Design Process ......................................................................................................................... 9  
Product Design Model .............................................................................................................. 10  
Learning Principles and Instructional Strategies ...................................................................... 11  
Deliverables ............................................................................................................................. 11  
Required Resources ................................................................................................................. 12  
Milestones and Timeline .......................................................................................................... 13  
References .............................................................................................................................. 14  
Appendix A – Figures .............................................................................................................. 16  
Appendix B – Tables ................................................................................................................ 19
Executive Summary

Background

High-proficiency second language acquisition (SLA) sustainment programs utilize authentic materials in task-oriented learning environments. The goal of such programs is to foster sustainable, autonomous language learning. However, in Department of Defense (DoD) sustainment programs, course managers face challenges in managing student learning plans and tracking student progress. Existing learning management systems provide some tools for managing course content, developing activities, and tracking learner analytics. However, sorting, evaluating, and implementing authentic content while maintaining a structured course design plan requires a cost-prohibitive amount of financial and human resources. Furthermore, course managers often lack the requisite knowledge, skills, and resources to run an effective language sustainment program. DoD language sustainment programs also lack the mechanisms for collecting and analyzing program-specific metrics to inform policy decisions.

Project Goal

This proposal offers to develop a prototype language acquisition sustainment expert system (LASES) to facilitate learner scaffolding, advance organizers, and autonomous learning for DoD SLA sustainment efforts. This prototype’s scope will be limited to Chinese Mandarin, but considerations will be made for incorporating other languages in order to provide a scalable design model.

Considerations and Constraints

The scope of this project is largely dependent on identifying a research sponsor and a suitable product evaluation test group. In addition, many of the computer-adaptive functions proposed depend on establishing partnerships with researchers in the computer science, natural language processing, and computational linguistics fields. At a minimum, this project will research and explore a proof of concept for LASES as described in the Proposed Solution section below.
Estimated Timeline and Costs

Table 1.
Estimated timeline and costs.

<table>
<thead>
<tr>
<th>Phase of Development</th>
<th>Estimated Timeline</th>
<th>Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 1</td>
<td>Identify funding and research subject</td>
<td>2 Months</td>
</tr>
<tr>
<td>Phase 2</td>
<td>Planning and needs analysis</td>
<td>1 Month</td>
</tr>
<tr>
<td>Phase 3</td>
<td>First iteration of prototype</td>
<td>2 Months</td>
</tr>
<tr>
<td></td>
<td>Second iteration of prototype</td>
<td>1 Month</td>
</tr>
<tr>
<td></td>
<td>Third iteration of prototype</td>
<td>1 Month</td>
</tr>
<tr>
<td>Phase 4</td>
<td>Implementation</td>
<td>3 Months</td>
</tr>
<tr>
<td>Phase 5</td>
<td>Summative evaluation</td>
<td>1 Month</td>
</tr>
</tbody>
</table>

Analysis

DoD language sustainment programs encompass a variety of services and agencies that function within diverse environments and possess diverse needs. This project will explore three potential clients for funding and support: (1) Advanced Distributed Learning (ADL) CoLab, (2) Center for Advanced Study of Language (CASL), or (3) the US Navy Center for Language, Regional Expertise, and Culture (CLREC). Additionally, three target audiences will be considered for this project: (1) US Navy active component students, (2) Defense Language Institute Foreign Language Center (DLIFLC) Directorate of Continuing Education (CE) students, or (3) US Army National Guard component students. Each potential client and target audience will be analyzed for: institutional goals and policy, available human/fiscal/physical resources, administrative support systems, learner characteristics (i.e, motivation/volition, learning style, performance gaps, etc.).

Following is a brief treatment of the general organizational and learner characteristics based on a preliminary literature review:

Organizational Analysis

Overview. Military leadership supports education and training with the goal of advancing mission effectiveness in an increasingly complex, global environment (Office of the Under Secretary of
Defense, 2010). The military linguist training lifecycle is time and resource intensive and the DoD is concerned with obtaining a return on their investment. The Foreign Language Proficiency Bonus (FLPB) incentive program is an example of the DoD’s commitment to language sustainment efforts. In this program, qualified linguists receive a monthly bonus allotment for maintaining their proficiency levels. After the project stakeholders are identified, a thorough needs analysis will be conducted to fully understand the stakeholder’s expectations on (1) how language instruction is conducted, (2) how technology is used in language sustainment training, and (3) the role that training plays in the day-to-day life of the military linguist.

**Performance gap.** A human performance technology (HPT) model (Figure A1) will be used to analyze the nature of performance gaps and inform the selection of appropriate interventions. The performance gap will be determined by comparing the desired end-state and the existing state as defined by the following process:

1. Review organizational documents to determine the strategy, mission, and goals.
2. Interview leaders to determine the desired end-state for military linguists.
3. Collect performance data from the identified audience. Supervisors and participants will be surveyed to determine the existing state, including: (1) contextual constraints, (2) organizational support, and (3) existing support tools.

**Challenges.** Due to the unique nature of the client, instructional transactions might occur between continents or across time zones. In addition, stakeholder information technology infrastructure as well as security and privacy requirements are factors when developing technology-mediated instruction (Reiser & Dempsey, 2012, Ch. 19). The military sector is rife with administrative challenges. The development lifecycle will vary depending on the client’s determination for the scope of the project. In addition, military planning goes through quadrennial cycles while upper leadership can change as often as every year. Consequently the goals and priorities frequently change. Finally, training budgets undergo a high level of scrutiny and direct feedback from end-users can significantly impact a training program (Reiser & Dempsey, 2012, Ch. 19).
Opportunities. Military programs offers a number of opportunities, including: available funding sources, propensity for technology solutions, and channels for future research and development. First, ongoing educational technology research projects (such as CASL and ADL) are potential funding sources for LASES. These projects already possess existing contracting vehicles for government procurement of research efforts. Second, military training is oriented towards technology integration to overcome some of the challenges they face. As Bratten-Jeffrey and Jeffrey state, “The technology options now available to instructional designers afford them an opportunity to recommend varied training solutions that address a variety of instructional challenges at the individual level” (as cited in Reiser & Dempsey, 2012, Ch. 19). Third, this research project could be expanded to allow for further development of LASES and its capabilities.

Learner Analysis

General characteristics. The target audience for this project is made up of high-proficiency DoD linguists, language mentors, and the stakeholders concerned with language sustainment efforts. The target users are full-time (active duty) or part-time (National Guard) linguists. As such, they are adult language learners with varying levels of time and volition. Today’s military workforce is diverse, possessing a wide variety of past education, employment, geographic, language, and cultural life experiences. In terms of training and education, they also possess a variety of personal motivations, goals, values, and beliefs. A thorough learner analysis will be conducted to collect data on learner characteristics. The project hopes to explore possible correlations between learner characteristics, participants’ use of the expert system, and their summative learning outcomes after LASES use.

Capabilities and competencies. At some point in their career, DoD linguists certify at a minimum Interagency Language Roundtable (ILR) proficiency level of 2 in listening and 2 in reading based on the Defense Language Proficiency Test (DLPT). Their jobs require a high degree of research, communications, and general computer skills. Therefore, the participants should have the prerequisite language learning aptitude and prerequisite knowledge and skills to use LASES.
**Learning styles.** Three measurement instruments will be used to analyze the participants’ learning style—the Jung Typology Test, Index of Learning Styles Questionnaire, and Motivated Strategies for Learning Questionnaire. In addition, a project survey will be administered to determine the participants’ beliefs about learning, motivation to study their target language and culture, attitudes towards the role of technology in learning, personal study skills, and volition strategies. The results from this analysis will serve two purposes: (1) inform user experience considerations in the design of the prototype and (2) provide data to explore possible correlations between learning characteristics and their use of the EPSS support tools.

**Learner needs.** The target audience would possess an ILR rating of 1+ in listening and/or a 1+ in reading as demonstrated by their most recent annual certification on the Chinese Mandarin DLPT. The DoD minimum proficiency level is 2 in listening and 2 and reading. The target learner lacks the requisite volition and/or autonomous learner skills to maintain their language proficiency. This is exhibited by a stable or downward trend in their proficiency scores since graduation from the Defense Language Institute (DLI). Based on the project survey, the ideal participant would exhibit moderate to high motivation to study their language and culture, would not possess strong biases against the use of technology in learning, would have moderate to low study skills, and would possess moderate to low volition strategies. This pre-selection process limits confounding of project assessment data with ancillary considerations (i.e., low motivation to learn the language or strong biases against technology).

**Solution Description**

**Proposed Solution**

To address the problems and needs of the end-user, this project proposes the development of a prototype language acquisition sustainment expert system (LASES). Based on previous research, an EPSS can provide the learner with scaffolding, advance organizers, assessment, and autonomous learning support (Van Schaik, Pearson, & Barker, 2002; Hung & Chao, 2007; Barker, Van Schaik, & Fumakinwa, 2007; Chen & Hsuing, 2008; Chen et al., 2009). In particular, Chen & Hsuing (2008) demonstrate how computational linguistics techniques employed in an EPSS framework can provide SLA training support.
The scope of this project will be limited to Chinese Mandarin, however it will provide a scalable design model for other languages. LASES will be a personalized learning environment allowing the student and/or language mentor to track completion of learning materials and the associated assignments and assessments.

**Product Objectives**

Given access to LASES, study time, and management resources, the language learner and mentor will be able to:

**Objective 1.** Create a learning plan tailored to varying learner characteristics, proficiency levels, and resources.

**Objective 2.** Select appropriate learning materials, study aids, and activities to target learner needs established in the learning plan.

**Objective 3.** Navigate and complete lesson topics and the associated assignments with the assistance of LASES support tools.

**Objective 4.** Evaluate and track learner progress.

**Objective 5.** Communicate learner progress to all designated stakeholders.

**Procedural Analysis**

Table B1 delineates the learning procedure and the roles played by the EPSS, learner, and language mentor in: (1) creating learning plans, (2) selecting learning materials and tools, (3) implementing the learning plan, and (4) assessing and tracking learner progress, and (5) communicating learner progress.

**Delivery Format and Media Components**

The resources available to the end-user and the desired outcomes will largely dictate the delivery format of this prototype. Ideally, the prototype would be designed in a platform agnostic manner, incorporating SCORM standards to communicate with client learning systems. The prototype could be delivered using an external website or mobile application, depending on the needs of the user.
Content (including multimedia content) will be aggregated from available open-source, government content libraries. DLI provides a free library of on-line, language sustainment learning objects called Global Language Online Support System (GLOSS). In Chinese Mandarin alone, GLOSS contains 364 listening and 397 reading learning objects (each with associated learning activities). DoD also has an online learning management system called Joint Language University (JLU) that offers some learning management functions, such as (1) tracking of assignment completion, (2) learning plans, (3) help resources, and (4) proficiency assessments.

**Anticipated Challenges**

A more thorough needs analysis may show additional environmental challenges, however based on a cursory review, the following factors should be taken into consideration:

- **Bandwidth and software compatibility.** The target audience’s information technology infrastructure may not be able to support the most recent technology (i.e., HTML5, Flash, Shockwave, etc.). Therefore considerations must be made to ensure that LASES is compatible with legacy systems.

- **Contextual constraints.** Participants’ use of LASES could be affected by contextual constraints, such as: organizational support, competing job requirements, or personal life factors. Efforts will be made to limit such constraints that might adversely affect the desired outcomes of the project. For example, policy documents and standard operating procedures might need to be modified to allocate working hours for on-the-job language training. Mentorship contracts can be used to formalize the learner-mentor relationship and the expectations of both parties. Participants will also be screened to ensure that extenuating personal circumstances do not exist that might adversely affect their ability to participate in the research project.

**Methods and Procedures**

**Design Process**

In addition to the HPT design process, this project will utilize an ISD design model that incorporates an iterative design-development-evaluation process with on-going considerations given to the impact of delivery media functionalities (Figure A2). Each key function (deliverable) will undergo a
separate iterative production cycle. This will allow for the design process to be flexible and adaptable to on-going findings about the efficacy of LASES. Concurrent development of deliverables requires careful design planning of the super-system (database) with a standardized language that allows for the sub-systems to communicate.

**Product Design Model**

The LASES design model is informed by the form and function prescribed in definitions of a Personalized Integrated Educational System, or PIES (Reigeluth et al., 2008) and EPSS’s (Cagiltay, 2006). Reigeluth et al.’s PIES model addresses four roles: (1) recordkeeping, (2) learning planning, (3) instruction, and (4) assessment. These roles should be interconnected using technology to address standards (or “attainments”) and provide robust tools to encourage a constructivist approach to learning (Reigeluth, 1999). Cagiltay defines four basic EPSS components: (1) a database, (2) an expert system, (3) an instructional system, and (4) support tools. These components allow for users to interact with the system and their peers, and have the “flexibility to consult information at any time and engage in higher-order cognitive activities” (Hung and Chao, 2007).

**Table 2.**
*Comparison of LASES design model to LMS/EPSS frameworks and existing systems.*

<table>
<thead>
<tr>
<th>Function</th>
<th>PIES Design Model</th>
<th>EPSS Design Model</th>
<th>LASES Design Model</th>
<th>Existing Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recordkeeping</td>
<td>Database</td>
<td>User Interface</td>
<td>Study plans</td>
<td>LMS</td>
</tr>
<tr>
<td>Learning Planning</td>
<td></td>
<td>Learner Database</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Expert System/</td>
<td>Help System</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Support Tools</td>
<td>Expert System</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Scaffolding &amp;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Advance Organizers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instruction</td>
<td>Instructional System</td>
<td>Assessment</td>
<td></td>
<td>GLOSS/JLU</td>
</tr>
<tr>
<td>Assessment</td>
<td></td>
<td></td>
<td></td>
<td>JLU/DLPT</td>
</tr>
</tbody>
</table>

As Table 2 illustrates, the goal is for LASES to synthesize the two design models to provide a more holistic technology solution, containing six key elements: (1) a user interface, (2) learner database, (3) study plans, (4) help system, (5) expert system, and (6) assessments. The table maps the proposed
function to the existing DoD language sustainment systems (LMS, GLOSS, JLU, and DLPT) to illustrate where current gaps exist. It is important to note that the four existing systems are not interconnected and therefore do not fulfill this requirement as defined by Reigeluth et al.’s PIES framework (2008).

Learning Principles and Instructional Strategies

**Scaffolding.** Cagiltay states, “scaffolding is what makes a system an EPSS. Without scaffolding, such a system would be the same as an ordinary information system” (2006). Poehner (2011) illustrates the use of dynamic assessments in a second language acquisition context. Although Poehner’s work does not utilize an EPSS, it does provide a model for a co-constructed learning environment whereby the instructor provides scaffolding and promotes learners’ metacognitive skills. EPSS’s can support development of user expertise by providing just-in-time guidance as a scaffolding technique (Chen et al., 2009). This mitigates cognitive overload, develops metacognitive skills, and guides the student on identifying and processing information (Fadel & Lemke, 2008).

**Advance organizers.** Hung and Chao (2007) define advance organizers as “the ‘big picture’ before delving into details in individual components.” Ausubel outlines the general design principles to construct advanced organizers as: (1) subsumption principle, (2) assess the effectiveness of content materials on learner characteristics, and (3) choose between expository and comparative advance organizers (as cited in Hung and Chao, 2007, p. 184). Graphical layout of topics can serve as an advance organizer and thereby assist the learner in accessing and processing information (Hung & Chao, 2007).

**Autonomous learning.** Kop states that if students are to become autonomous learners “they also need some particular skills and competencies to be able to make the most of a learning environment that is positioned outside the sphere of formal education” (Kop, 2009). Barker et al. (2007) believe that EPSS’s “could be used as a change agent in order to motivate students and enhance their ability to learn independently,” a critical aspect of the “semiotic” dimension of learner autonomy (Bouchard, 2009).

**Deliverables**

Based on the design framework provided above, the project will include a proof-of-concept for one software deliverable (LASES v 1.0), with five modules:
1. Module 1: Recordkeeping (includes user interface and learner database functions)
2. Module 2: Study planning
3. Module 3: Expert system (scaffolding and advance organizers)
4. Module 4: Help system (system support and JIT resources)
5. Module 5: Assessments.

Module 1 is the overall foundation for LASES and the super-system for the other four modules. Modules 2-5 can be developed concurrently using the rapid prototyping method. In addition, the project will provide the following major deliverables (see Table B3 for additional details and timeline):

1. Instructional Design Document
2. Research Funding Proposal
3. Project Management Job Aids
4. Project Launch Briefing
5. Organizational and Learner Analysis
6. Design Guidelines
7. Formative Evaluation Report
8. Orientation Training
10. Summative Evaluation Report
11. Project Presentation

**Required Resources**

Table B2 lists the resources required for this project. LASES will require server space with FTP access and industry-standard LAMP (Linux, Apache, MySQL, PHP) architecture (see Figure A3). Other server architecture mixes might be considered based on availability and client needs. Web-based design and development will be conducted using Adobe Dreamweaver CS6. As mentioned earlier, to fully realize the advanced computing aspects of the LASES prototype a team of researchers and designers is
ideal, but not required. This will depend on procuring partnerships with other researchers and/or a source for research funding.

**Milestones and Timeline**

Since the stakeholders for this project are currently not identified, the milestones and timeline are subject to change based on changes to the scope of the project, the client, the target learner, and resources/funding procured. However, Table B3 lists the preliminary major milestones and projected timeline for development of a LASES proof-of-concept.
References


Appendix A – Figures

Figure A2. ADL ISD Framework for Mobile Learning.
Figure A3. Structure of a Typical LAMP Website.
## Appendix B – Tables

### Table B1.
*SLA Procedural Analysis*

<table>
<thead>
<tr>
<th>Task ID</th>
<th>Task Description</th>
<th>Performed By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td><strong>Create learning plan and study contract</strong></td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Create learner profile in database</td>
<td>X</td>
</tr>
<tr>
<td>1.1.1</td>
<td>Collect basic learner information</td>
<td>X</td>
</tr>
<tr>
<td>1.1.2</td>
<td>Complete questionnaires (MBTI, ILSQ, &amp; MSLQ)</td>
<td>X X</td>
</tr>
<tr>
<td>1.2</td>
<td>Complete initial diagnostic assessment</td>
<td>X X X</td>
</tr>
<tr>
<td>1.2.1</td>
<td>Identify the skill and sub-skill performance gaps</td>
<td>X X</td>
</tr>
<tr>
<td>1.2.2</td>
<td>Compare current study methods with alternative methods</td>
<td>X X</td>
</tr>
<tr>
<td>1.2.3</td>
<td>Determine strategies to address performance gaps</td>
<td>X X</td>
</tr>
<tr>
<td>1.2.4</td>
<td>Determine existing and potential barriers</td>
<td>X X</td>
</tr>
<tr>
<td>1.2</td>
<td>Draft achievable short and long-term goals</td>
<td>X X</td>
</tr>
<tr>
<td>1.2.1</td>
<td>Determine time needed to reach learning goals</td>
<td>X X</td>
</tr>
<tr>
<td>1.2.2</td>
<td>Draft study schedule</td>
<td>X X</td>
</tr>
<tr>
<td>1.2.3</td>
<td>Sign study contract</td>
<td>X X</td>
</tr>
<tr>
<td>2.0</td>
<td><strong>Select learning materials and tools</strong></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td>Select learning materials based on modality and level</td>
<td>X X</td>
</tr>
<tr>
<td>2.1.1</td>
<td>Select recommended GLOSS/JLU materials</td>
<td>X X</td>
</tr>
<tr>
<td>2.1.2</td>
<td>Find online materials related to learning goals</td>
<td>X</td>
</tr>
<tr>
<td>2.1.3</td>
<td>Select additional materials from language library</td>
<td>X</td>
</tr>
<tr>
<td>2.1.4</td>
<td>Select necessary study aids</td>
<td>X</td>
</tr>
<tr>
<td>2.2</td>
<td>Select activities to develop skills and sub-skills</td>
<td>X X</td>
</tr>
<tr>
<td>2.3</td>
<td>Evaluate materials and activities for applicability in obtaining goals</td>
<td>X X</td>
</tr>
<tr>
<td>2.4</td>
<td>Sequence learning materials into learning plan</td>
<td>X X X</td>
</tr>
<tr>
<td>3.0</td>
<td><strong>Implement learning plan</strong></td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>Provide advance organizers for topics</td>
<td>X X</td>
</tr>
<tr>
<td>3.2</td>
<td>Present new learning materials</td>
<td>X X</td>
</tr>
<tr>
<td>3.2.1</td>
<td>Complete learning activities</td>
<td>X</td>
</tr>
<tr>
<td>3.2.2</td>
<td>Provide learner with formative feedback</td>
<td>X X</td>
</tr>
<tr>
<td>3.2.3</td>
<td>Provide learner with scaffolding</td>
<td>X X</td>
</tr>
<tr>
<td>4.0</td>
<td><strong>Track and communicate learner progress</strong></td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>Evaluate student performance</td>
<td>X X</td>
</tr>
<tr>
<td>4.1.1</td>
<td>Evaluate skill and sub-skill metrics</td>
<td>X X</td>
</tr>
<tr>
<td>4.1.2</td>
<td>Evaluate autonomous learning metrics</td>
<td>X X</td>
</tr>
<tr>
<td>4.2</td>
<td>Adjust learning plan as needed</td>
<td>X X</td>
</tr>
<tr>
<td>4.3</td>
<td>Report learner progress to all stakeholders</td>
<td>X X</td>
</tr>
</tbody>
</table>
Table B2.
*Project required resources.*

<table>
<thead>
<tr>
<th>Development Tools</th>
<th>Required Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>Laptop/Desktop for each researcher, developer, and manager</td>
</tr>
<tr>
<td></td>
<td>Internet Connectivity</td>
</tr>
<tr>
<td></td>
<td>Recording equipment (microphone, recording room)</td>
</tr>
<tr>
<td>Software</td>
<td>Adobe CS 6 Dreamweaver, Photoshop, Illustrator</td>
</tr>
<tr>
<td></td>
<td>Microsoft PowerPoint</td>
</tr>
<tr>
<td></td>
<td>Adobe Audition</td>
</tr>
<tr>
<td></td>
<td>Adobe Premier</td>
</tr>
<tr>
<td></td>
<td>Web Browser (Firefox 17.0, IE 9.0, Chrome 23.0, Safari 6.0)</td>
</tr>
<tr>
<td></td>
<td>Microsoft Access</td>
</tr>
<tr>
<td></td>
<td>Microsoft Project</td>
</tr>
<tr>
<td>Web Server</td>
<td>Linux</td>
</tr>
<tr>
<td></td>
<td>Apache</td>
</tr>
<tr>
<td></td>
<td>MySQL</td>
</tr>
<tr>
<td></td>
<td>PHP</td>
</tr>
<tr>
<td>Project Tools</td>
<td>GoTo Meeting</td>
</tr>
<tr>
<td></td>
<td>Email (Gmail or Microsoft Exchange)</td>
</tr>
<tr>
<td></td>
<td>Online Calendar (Google Calendar or Microsoft Exchange)</td>
</tr>
<tr>
<td>Collaboration</td>
<td>Google Apps (Documents, Spreadsheets, Forms, etc.)</td>
</tr>
<tr>
<td></td>
<td>Online Task Management Software</td>
</tr>
<tr>
<td>Client Tools</td>
<td>Student/Mentor Personal Computer/Laptop/Tablet</td>
</tr>
<tr>
<td></td>
<td>Internet Connectivity</td>
</tr>
<tr>
<td></td>
<td>Headset with Microphone</td>
</tr>
<tr>
<td>Client Hardware</td>
<td>Operating System (minimum): Windows 7 (PC) or OS X (Mac)</td>
</tr>
<tr>
<td></td>
<td>Support Tools (Lexical Aids, Software Tools, Online Resources, etc.)</td>
</tr>
<tr>
<td></td>
<td>Web Browser (Firefox 17.0, IE 9.0, Chrome 23.0, Safari 6.0)</td>
</tr>
<tr>
<td>Client Software</td>
<td>20 Chinese Mandarin GLOSS/JLU Learning Objects (ILR level 2/2+)</td>
</tr>
<tr>
<td></td>
<td>DLIFLC Chinese Mandarin Online Diagnostic Assessment</td>
</tr>
<tr>
<td></td>
<td>Language Learning Library Content</td>
</tr>
<tr>
<td></td>
<td>Stock photos and clip art</td>
</tr>
</tbody>
</table>
### Table B3.
*Project major milestones and estimated timeline.*

<table>
<thead>
<tr>
<th>Milestones</th>
<th>Deliverables</th>
<th>Est. Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1 – Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X 1.1 Form project concept</td>
<td>• Project idea final draft</td>
<td>10/30/2012</td>
</tr>
<tr>
<td>X 1.2 Research topic/literature review</td>
<td>• Research paper</td>
<td>11/27/2012</td>
</tr>
<tr>
<td>X 1.3 Meet with project advisor (initial meeting)</td>
<td>• -</td>
<td>11/29/2012</td>
</tr>
<tr>
<td>X 1.4 Finalize project proposal</td>
<td>• IDD v 0.1</td>
<td>12/17/2012</td>
</tr>
<tr>
<td>1.5 Solicit project stakeholders and partners</td>
<td>• Partnership agreements</td>
<td>1/22/2013</td>
</tr>
<tr>
<td></td>
<td>• Research funding proposals</td>
<td></td>
</tr>
<tr>
<td>1.6 Meet with project advisor (Phase 1 overview)</td>
<td>• IDD v 0.2</td>
<td>1/25/2013</td>
</tr>
<tr>
<td>1.7 Setup project administration tools</td>
<td>• Project job aids</td>
<td>2/1/2013</td>
</tr>
<tr>
<td></td>
<td>• Account setup</td>
<td></td>
</tr>
<tr>
<td><strong>Phase 2 – Analysis Phase</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1 Brief stakeholders on project details</td>
<td>• Project launch briefing (PPT)</td>
<td>2/1/2013</td>
</tr>
<tr>
<td></td>
<td>• IDD v 0.3</td>
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<tr>
<td>2.2 Organizational needs analysis</td>
<td>• Document review</td>
<td>2/15/2013</td>
</tr>
<tr>
<td></td>
<td>• Interviews</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Resources/constraints report</td>
<td></td>
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<tr>
<td></td>
<td>• Findings report</td>
<td></td>
</tr>
<tr>
<td>2.3 Conduct learner and environment analysis</td>
<td>• Learner survey data</td>
<td>3/1/2013</td>
</tr>
<tr>
<td></td>
<td>• Learner needs assessment</td>
<td></td>
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<tr>
<td></td>
<td>• Findings report</td>
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<tr>
<td>2.4 Refine task analysis and objective statements</td>
<td>• -</td>
<td>3/4/2013</td>
</tr>
<tr>
<td>2.5 Meet with project advisor (Phase 2 overview)</td>
<td>• IDD v 0.4</td>
<td>3/6/2013</td>
</tr>
<tr>
<td>2.6 Meet with project team</td>
<td>• Design/Development Timeline and Deliverables</td>
<td>3/8/2013</td>
</tr>
</tbody>
</table>
### Phase 3 – Design/Development/Evaluation (D/D/E) of Module 1

| 3.1 Define Module 1 design guidelines | • Style sheet  
|                                       | • Storyboards  
|                                       | • Technical specifications | 3/8/2013 |
| 3.2 Iteration 1 of GUI v 0.1          | • Sample feedback  
|                                       | • Revision report | 3/15/2013 |
| 3.3 Iteration 2 of GUI v 0.2          | • Sample feedback  
|                                       | • Revision report | 3/22/2013 |
| 3.4 Iteration 1 of DB v 0.1           | • Test data  
|                                       | • Database map  
|                                       | • Revision report | 3/22/2013 |
| 3.5 Iteration 2 of DB v 0.2           | • Test data  
|                                       | • Updated database  
|                                       | • Revision report | 3/29/2013 |
| 3.6 Iteration 3 of GUI v 0.3 and DB v 0.3 | • Actual data collection  
|                                           | • Interface report  
|                                           | • Revision report | 4/12/2013 |
| 3.7 Module 1 v 1.0                    | • Sample feedback  
|                                       | • Revision report | 4/19/2013 |
| 3.8 Module 1 v 1.1                    | • Formative evaluation  
|                                       | • Revision report | 4/26/2013 |
| 3.9 Meet with project advisor (Phase 3 overview) | • Phase 3.0 D/D/E Report  
|                                           | • IDD 0.5 | 5/1/2013 |

### Phase 4 – D/D/E of Modules 2-5

| 4.1 Define Modules 2-5 design guidelines | • Style sheet  
|                                       | • Storyboards  
|                                       | • Technical specifications | 5/10/2013 |
| 4.2 Iteration 1 of Modules 2-5 v 0.1    | • Initial module content  
|                                       | • GUI/DB interface  
|                                       | • Revision report | 5/31/2013 |
| 4.3 Iteration 2 of Modules 2-5 v 0.2    | • Additional module content  
<p>|                                       | • Revision report | 6/14/2013 |
| 4.4 Iteration 3 of Modules 2-5 v 0.3    | • Additional module content | 6/28/2013 |</p>
<table>
<thead>
<tr>
<th>4.5 Modules 2-5 v 1.0</th>
<th>• Revision report</th>
<th>7/12/2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.6 Meet with project advisor (Phase 4 overview)</td>
<td>• IDD v 0.6</td>
<td>7/26/2013</td>
</tr>
</tbody>
</table>

### 5.0 LASES Pilot Program

| 5.1 Implement LASES v 0.1 pilot program | • LASES v 1.0  
• Pilot participant list | 8/2/2013 |
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>5.2 Implement Study Plan Module</td>
<td>• User feedback report</td>
<td>8/5/2013</td>
</tr>
<tr>
<td>5.3 Implement Expert/Help System Modules</td>
<td>• User feedback report</td>
<td>8/12/2013</td>
</tr>
</tbody>
</table>
| 5.4 Conduct mid-pilot sensing session | • User feedback report  
• Debug report  
• LASES v 0.2 | 8/21/2013 |
| 5.5 Project Presentation | • Project Progress Report | 8/23/2013 |
| 5.6 Continue Expert/Help System Module implementation | • User feedback report | 8/26/2013 |
| 5.7 Implement Assessment Modules | • User feedback report | 9/2/2013 |
| 5.8 Conduct pilot evaluation survey | • User feedback report  
• LASES v 1.0 | 9/13/2013 |
| 5.9 Meet with project advisor (Phase 5 overview) | • IDD v 0.7 | 9/18/2013 |

### 6.0 LASES Implementation and Summative Evaluation

| 6.1 Present LASES development after action report (AAR) | • AAR briefing (PPT)  
• AAR (digital copy)  
• IDD v 1.0 | 9/27/2013 |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>6.2 Implement LASES 1.0</td>
<td>• Orientation training</td>
<td>10/4/2013</td>
</tr>
<tr>
<td>6.3 Conduct 2-month summative evaluation</td>
<td>• Evaluation report</td>
<td>12/3/2013</td>
</tr>
<tr>
<td>6.4 Meet with project advisor (Phase 6 overview)</td>
<td>• Project report and findings</td>
<td>12/11/2013</td>
</tr>
<tr>
<td>6.5 Present project</td>
<td>• Project Presentation</td>
<td>1/24/2014</td>
</tr>
</tbody>
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