

Teaching Platform Technical Analysis

Executive Summary

The purpose of a technical analysis of teaching platforms is to ensure that a teaching and learning system is built to support the E-Language learning program. To that end, this report provides background information and describes the work to date on the technical analysis of teaching platforms. Preliminary analysis has been completed. The result is a set of assumptions, a discussion of options regarding a selection and evaluation process, a proposed framework for a technical infrastructure design, and a brief discussion of outstanding issues that need to be addressed. Many of the decisions that need to be made related to the teaching platform are directly related to decisions of other workgroups; it is therefore especially valuable to have cross-workgroup conversations in order to ensure timely progress.

This paper also covers issues related to the selection of a learning management system. Appendix 1 provides a list of recommended functions and features. Appendix 2 recommends Screening Criteria for preliminary, first-level evaluation. Appendix 3 provides a comprehensive Evaluation Matrix tool that reflects in greater technical detail the functions outlined in Appendix 1. This evaluation matrix can be used as part of the selection of and/or development of a technical system. Appendix 4 contains a glossary of terms to help translate functional needs in to technical requirements.

Key Questions To Consider

1. Are the assumptions laid out in this paper the correct underlying assumptions? Is the weighting of criteria for the evaluation and selection of teaching platforms appropriate? Are there functional needs not included? Are there key selection criteria that are missing? For example, should we be considering conformance to the Sharable Content Object Reference Model?
2. Should we have a competition for the platform as part of the pilot phase, or only for the long-term system? For example, does the prototype need to demonstrate full functionality within a system, or not? Is it critical to test all pieces together as part of a demonstration, and does this demonstration then serve as a basis for selection? Is a demonstration phase needed as part of the selection and evaluation process?
3. Are there non-negotiable features or components around which the system needs to be designed? Is so, what are they?

4. Are the functional needs referenced in this document, and especially in Appendix 2, the appropriate criteria for any competition for the selection of the teaching or learning management system platform?
5. How can we allow for flexibility, ingenuity, and opportunity in a competition, remain open to ideas not yet considered, and at the same time include the value of standards?
6. If we use specialized software (for example, continuous text to speech), with limited applications and limited uses, can these still be integrated in to a teaching platform successfully?
7. How do you integrate communications technologies into the content to form a seamless instructional system? Do the communications technologies need to be built so that they can integrate in to systems? Are there technical requirements related to integration that need to be considered if they are to work within a larger system? Or, should they drive the selection of the larger teaching platform?
8. To what extent does a learning environment need to include all of the basic functions of a learning system - from content development to content management, content delivery, and content maintenance and upgrade? Should we only be concerned about content delivery?
9. Do all the content/learning objects, tools, communication technologies, student information tracking, and so on, need to be consolidated in to the game (as opposed to a modular approach)? In other words, is the game both object and framework, or is the game a set of learning objects that is a subset of a larger collection of learning activities?
10. To what level do we want to collect student data? To what extent do we want to aggregate student data within a learning management system in the prototype? In the long term, fully operational system (keeping in mind that there are as many as 200 million users in China and that the United States has privacy issues regarding students)?

Background and Work to Date

For the purposes of this paper a "teaching platform" refers to an integrated technical system that includes, at minimum, content development tools, content storage features, content management features such as learning object aggregation and dis-aggregation, administrative functions, online instructional environments and tools, and a content delivery system.

A teaching platform is essential to support online learning at a distance. Use of a teaching platform is also perceived as a clear advantage to supplement in-classroom

activities. Online learners have come to expect user-friendly, convenient, accessible, "smart" learning systems that deliver learning "products" – groups of learning activities that are organized in to coherent packages.

The next generation of learners has come to expect learning that is experiential, active, authentic, and engaging. A teaching platform is one of the most effective ways to provide the framework that can foster such characteristics.

A teaching platform is usually seen as one part of a larger infrastructure. Many teaching platforms include other features such as instructor-friendly tools, online helpdesks, evaluation feedback mechanisms, sophisticated assessment strategies, student progress tracking tools, adaptive learning strategies and portals.

Few, if any, teaching platforms address the unique technical requirements of the E-Language project. One such requirement involves speech recognition/synthesis/translation capabilities. (Refer to separate paper and recommendations). Another involves child-friendly email that protects privacy.

Even a preliminary review of one of the significant elements of a teaching platform, the Learning Management System (LMS), suggests that the needs of the E-Language project will not simply "shoe horn" in to an "off the shelf" product, whether a Commercial Off-the-Shelf product (COTS) or a Government Off-the-Shelf product (GOTS). While many LMSs will state that they are flexible, interoperable, and can "add-on" features such as voice recognition, the common strategy is to build links to connect these "add-ons" outside the LMS. In such a case, the student needs to go outside the framework, complete an activity, and then return to the learning system. In other words, add-on features are *not* fully integrated.

The selection process for what is being called a teaching platform is complex. The selection of a product is not so much about simply locating and installing a Commercial Off-The-Shelf (COTS) learning management system (LMS) as it is about accurately and specifically identifying the E-Language project needs, identifying the learning strategies, tools and products that can support these needs, and then customizing aspects of a system to integrate the various needed functions and features.

The following is the status on work to date:

- sketched out the basic infrastructure components;
- placed the components of the teaching platform within the framework of the larger infrastructure;
- preliminary work on technical requirements document - current work on the learner profile, definition of types and level of the content, types of materials and learning strategies, how the system will be used, and by what variety of users – this work has been analyzed to help specify the technical requirements;

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- a series of assumptions has been drawn up in order to help clarify technical support needs, and form the basis of a Technical Functions and Requirements document;
- a list of functional needs, with weighted criteria, has been proposed for discussion. Refer to Appendix 1;
- a preliminary set of screening criteria has been proposed. Refer to Appendix 2; and
- a more inclusive (rather than exclusive) evaluation matrix tool has been built. These criteria can assist with the evaluation of a learning management system (LMS). Weighting of these criteria in terms of their importance is proposed as part of this paper.

Assumptions On Which To Build A Teaching Platform

The technical analysis performed to date takes a “systems” approach. The analysis looks at recognized system elements and related assumptions, including:

- the ***users***, their profiles, how they will use the system, what kinds of features and functions are needed to perform their tasks. Users can include: learner, instructor, tutor, administrator, technical system support personnel, and so on. User needs and designing for pedagogical excellence are referenced under four separate tabs in Appendix 3 – Pedagogical Design, Learner Tools, Instructor Tools, and Administrator Tools. Refer to Appendix 3.

The following is assumed:

- that in the first phases of rollout the students will have a high degree of technical literacy and comfort with an online venue;
 - that the content will be used as both a stand-alone and a supplementary product within the classroom;
 - that there will be “social” support for the use of the product by instructors and tutors;
 - that administrators and instructors will need reports that track student progress, and that student progress is directly tied to other recognized assessments.
- the types and ***characteristics of the content***, the format and organization of the content, the technical nature of the content (software used), how the content will be accessed, stored, aggregated, archived, re-used, and so on. Some of the considerations involve standards, reusability, accessibility, interoperability, longevity (durability) of the content, level, and so on. How content is organized for users is referenced under two tabs in Appendix 3 – Pedagogical Design and Standards. Refer to Appendix 3.

The following is assumed:

- that the instructional content is tied to clearly identified learning objectives;
 - that assessments and testing are already established, and that learning content needs to respect those established benchmarks;
 - that the organization of the content conforms to best practices in instructional design;
 - that the content, including gaming content, is built in software products such as XML, Macromedia, Authorware and Adobe products;
 - that the content is designed for longevity, durability, and reusability, as well as descriptive practices that support instructor use and re-use;
 - that a gaming strategy is only one of several learning strategies; other strategies may include practice sessions, collaborative communication sessions; vocabulary building, both traditional and self-check assessments, as well as other kinds of games;
 - that although the game may be the centerpiece of the learning strategy that there are a variety of other functions that are needed to support full use of the program; those features may include voice chat, online discussion groups, search and retrieval of resources, and so on;
 - that instructors need to be able to access different parts of the content, so the content needs to be flexible and instructor-friendly.
- **delivery and distribution modes**, how will users gain access to the features and functions they need to perform their tasks, how available/secure is the system and its contents, to what extent is the distribution seen as ubiquitous, and so on. How accessible, available, and easy-to-use is the system. Capacity, scalability, and security are referenced primarily under the Technical Support tab in Appendix 3.

The following is assumed:

- that three modes of delivery are anticipated – 1) online only, 2) a hybrid model with a web-interface and heavy graphics on a CD, and 3) CD only. The CD only delivery poses challenges for assessment and evaluation, since data will need to be collected through other vehicles;
- the value of a security system is in protecting the integrity and functionality of the program, and in protecting individual student information;
- initially distribution will be limited to select regions where there is substantial technical support and technical literacy. Roll out will link to readiness, but not drive it.

- ***maintenance and continuous upgrade*** features, the extent to which the system was constructed in a flexible, robust, and dynamic manner in order to stay abreast of changes in learning strategies, incorporate standard practices, procedures and processes as the industry creates consensus, quality controls, and so on. The company's vision, corporate profile, and prestige within the field are referenced under Pricing and Company Profile in Appendix 3.

The following is assumed:

- that the initial work is intended to provide a working model, or a sample, which, at some point in the future, may be expanded. The framework that houses the initial work needs to be constructed for flexibility and for dynamic change;
- that as the product is used, instructors and students will provide feedback requesting modifications, changes, and additions;
- that agreements will be reached regarding periodic upgrades to the technical features, content changes and additions, and a process of continuous improvement will be implemented.

Selection and Evaluation Process

The timeline for the E-Language project is aggressive. Given the complexity of the technical considerations, the issues around scale, and the necessity for testing highly specialized technologies, like voice recognition and speech translation, the following is recommended:

- That prototype construction, testing, and demonstration proceed along a timeline parallel to a longer and more deliberate learning management system evaluation process.
- That a "demonstration" phase be built into the standard evaluation process. The following process steps are proposed:

<i>Process Steps</i>	<i>Discussion</i>
<p>Step One: Agree to functional needs. Agree to essential, "non-negotiable" features that may drive the selection process. Identify (refine and agree to) needed features as screening criteria, constraints/limitations, priorities, and possible timelines related to testing, demonstration and evaluation.</p>	<p><i>This remains a fairly standard first step.</i></p>

Process Steps	Discussion
<p>Step Two: Draft infrastructure design. Lay out technical infrastructure design, basic functions and features, and how all of the parts work (interoperate) together to support the learning activities.</p>	
<p>Step Three: Agree to first-level screening criteria. Agree to evaluation criteria and weighting. Identify first level screening criteria. Refer to Appendix 2.</p>	<p><i>As part of these first three steps, all dependencies need to be identified. For example, since highly specialized software, such as speech recognition, speech translation, etc. are fundamental to the success of the project, perhaps decisions regarding these applications need to be made first. Then, learning system vendors will know that their product must be able to integrate and work with the specific features of a speech recognition product. Similarly, if there are privacy issues for children and an email system needs to be able to protect the privacy of children, perhaps the best products need to be selected prior to any evaluation of a learning management system. This is, of course, especially important if proprietary products are selected which are not built to recognized standards.</i></p>
<p>Step Four: Involve vendors, product developers, and those who may need to build customized elements. Refine evaluation criteria and weighting based on input from product developers. Invite participation from vendors who may have ideas and insights to contribute.</p>	<p><i>What are in effect "non-negotiable" features need to be separated from preferred features. If specific technologies are considered "essential," and if specific products are deemed superior, then decisions regarding those technologies and products need to be made if not prior to Step Four, then as part of Step Four.</i> <i>Note that prior to Step Four, before vendors are invited to become involved in the process, it is important to agree to the evaluation process and the basic philosophy.</i></p>

Process Steps	Discussion
<p>Step Five: Screen participating systems. Reduce number of identified systems to a select group for in-depth evaluation and testing with content modules and communications technologies.</p>	<p>This step does not need proceed according to the same time line as the pilot phase, or the construction of the prototype.</p>
<p>Step Six: Evaluate selected systems, using agreed-upon evaluation tools. Components need to be tested individually and as part of the whole system (how all of the pieces work together). Add-on tools need to be identified so that they can be included as part of the testing step. Systems need to be able to be tested using real content, prototypic content, or simulated content.</p>	<p>Like step five, this step can proceed over a longer period of time.</p>
<p>Step Seven: Based on testing and evaluation, make recommendations. This recommendation is usually accompanied by an explanatory report that details what can and cannot be accomplished most effectively and with the best results for short-term, mid-term, and long-term goals. The cost of customization and a return-on-investment analyses need to be included.</p>	<p>As with steps five and six, this step can proceed over a longer time period.</p>

Issues for Cross-Group Discussion

The following is a list of issues that require additional conversation, clarification and consensus across workgroups.

Student information tracking. In a number of areas, such as student tracking, the issues are not so much technical as they are social or policy issues. What kinds of information will be tracked? Where will the information be stored? How will the information be used? What information is needed for purposes of reporting? How do privacy issues affect the need for information protection and data security concerns?

Hosting and ongoing maintenance. The learning products currently under discussion focus on Chinese as a foreign language and English as a foreign language. There have been discussions that also included Spanish as a foreign language and English as a Second Language for native Spanish speakers. If a vendor is expected to host, support, and maintain a product in any countries other than China, and/or if other languages need to be supported, including story lines and learning activities, the vendors need to understand the scope of their responsibility. A multi-lingual approach needs to be included as part of the evaluation criteria.

Conclusions and Recommendations

Based on the preliminary analysis the following conclusions are offered:

- there are a number of learning management systems (LMS) that probably meet a majority of the needed features to ensure an adequate learning infrastructure. However, it seems likely that no one system will meet all requirements without some degree of customization.
 - It is recommended that a technical requirements document be developed and that the steps outlined above be followed as part of a more formal evaluation process.
- an LMS represents one part of a needed technical infrastructure design.
 - It is recommended that the requirements for the larger infrastructure, which has technical, social, and policy implications, be outlined before a final decision regarding an LMS or other technology tools is made.
- instructional design and development of the content needs to precede the selection of the tools, technology, systems and infrastructure necessary to support the instructional content, strategies, and activities. Significant work still needs to be done in this area so that it can better inform the evaluation process. It should also be noted that prototypes can be developed without making a commitment to an LMS, or even to the design of the technical infrastructure.
 - It is recommended that, while the LMS evaluation process should go forward, it must remain secondary to content design and development.

Appendix 1

Functional Technical Needs for the E-Language Teaching Platform

The following is a list of proposed features and functions, with a recommended weighting strategy. The features outlined are needed to support teachers, learners, and administrative and technical support staff.

1. Servers are distributed: There are different host servers in each country (one in the U.S., one in China)
2. Servers are mirrored. There are several servers that act as mirror sites so that users can access learning resources quickly and reliably.
3. Learner profiles are automatically updated: When the user logs in to the host server, the router directs the user to the nearest functional server. The server automatically updates the student profile to the host server.
4. Any "unconnected" schools can install the whole system and program locally on their own server(s); all of the student profiles can be packed, delivered and stored on a local server, and all the profile information can be delivered to a host server. Delivery modes are various (email, fixed storage, etc.)
5. The single-user version can be installed on to the student's own local computer. The entire program can run on a stand-alone CD-ROM. The student's profile can be output as a file via a storage medium (diskette), or via the web, and then sent on to the host server.
6. The system should have adaptive or "smart" functions. For example, when the students click on an unknown object, the amount of feedback should depend on the learner's proficiency level. In the early stages of the program, for example, a tip might be displayed with both English and Chinese (if that feature is turned on), later there might be only Chinese or only English words to explain the term.
7. When the student does not know how to express a word or a concept, he or she can input his native language (via voice or text), and ask for a text output or a voice output. The student can also use a dynamic dictionary.
8. There are self-assessments and self-checks integrated within the game. For example, points earned from the self-assessment can add to or reduce the student's power.

Functional Needs for Students

No.	Operation	Requirement for technology	category
1	Click the icon (off-line), redirect, or visit a website	The system is smart and checks to be sure that all the needed plug-in components, such as flash, are functioning. Other plug-in are loaded automatically, as needed.	tech
2	Login	1. Because several users may use one computer at different times, each log in is different. (user identification). It is also beneficial for a user to be able to visit the course website from different geographic locations. No automated registration requirement in this project.	admin
		2. loaded in the user's profile	admin
		3. based on the learner profile, the system is "smart" and directs the learner to tasks	adaptive
3	Feedback and grading	The learning actions are designed to be integrated within the courseware. Feedback is immediate and programmed into the courseware. If the exercises are integrated in to the courseware, the student's grade should be recorded by the program and sent to the grading feature in the LMS.	CBT to LMS
4	Summary	At the beginning and end of each unit, there needs to be a statement of goals and a summary of the key points (key words). Smart "recall" tools need to be integrated. Information needs to be tracked as part of the student profile.	Bookending learning strategy
5	Practice alone	There are self-check (questions with immediate feedback) assessments. Feedback is automated, can provide correction and redirect the	Practice learning strategy

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		learner to other learning resources. Scores are recorded in the student profile.	
6	Practice-in real world situations	Role play between two students or several students	Peer-to-peer learning and role playing
7	Communication with others	Ask questions, discussion, post articles,	Communication tool
8	Statistics reporting	A variety of reports track individual and group progress. Metrics, benchmarking and numbers that assist administrators evaluate the success of the project as a whole.	Administration and program evaluation

Procedure for teachers

No.	Operation	Requirement for technology	category
1	Click the icon (off-line) or visit a website	The system will find out if it will start all the basic plug-in components, such as flash runner. Other plug-in will be loaded when they are needed.	tech
2	Login	User identification. Don't need automated registration	admin
		loaded in the user's profile	admin
		based on the profile, provides a task list	adaptive
3	Teach and develop new materials	The teacher can control the courseware when the teacher is in the classroom. The teacher can develop materials within the LMS to assist students.	CBT to LMS
4	Grading	The teacher can grade online. Can do online markup.	Teacher
5	Communication with others	The teacher can answer questions, facilitate discussion, post articles, and guide students online. All communication is archived for ready reference.	Communication
6	Learning Activity management	The instructor can pair or group students, design learning routing	Teacher
7	Statistics review	Instructors have access to statistics on students so as to be able to	Admin and program

		guide, help, or remediate. System captures evaluative and assessment data.	evaluation statistics
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Evaluation Criteria for E-language Platform (80points)

No.	Criteria	Description	Weight
Communication Tools			
1	Discussion Forums	<ul style="list-style-type: none"> • Discussions can be viewed by date, by thread, and by title. • Posts can be plain text, formatted text, or URLs. • Instructors can determine the level of involvement (read, write, or post anonymously) for students • Instructors may create separate discussion environments for small groups • Allow students to create groups. 	5
2	File Exchange	<ul style="list-style-type: none"> • Students can submit assignments using drop boxes. • The system allows batch upload/delete files • The system offers students a space for file storage/management 	3
3	Internal Email	<ul style="list-style-type: none"> • Students can use the Internal email feature to email individuals and groups. • Students can attach and archive files and can forward messages to external email accounts. • Students can search email subject lines. • Voice email function 	4
4	Real-time Chat	<ul style="list-style-type: none"> • The chat tool supports private rooms, private messages, and can ignore or block specific participants. • Instructors can schedule chats using the course calendar. • The chat tool supports a structured way for students to ask questions and instructors to provide answers. • The chat tool supports up to at 	5

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		least two simultaneous group discussions. <ul style="list-style-type: none"> • Voice chat and the whole chat procedure can be recorded as wanted 	
5	Whiteboard	<ul style="list-style-type: none"> • The software supports a whiteboard. • The whiteboard can be controlled by instructor and students • The whiteboard supports PowerPoint and web page slideshows and group web browsing. 	3
Learner Tools			
1	Student Portfolios	<ul style="list-style-type: none"> • Students can create bookmarks in a private folder, and display, manage and update them • Students can set their own online calendar • Students can create a personal homepage with a software tool that does not require them to know html. • In the homepage they can upload their picture add bookmarks and other personal information. 	4
2	Online help	<ul style="list-style-type: none"> • Students have access to online help for the discussion forum and for the internal e-mail as well as small helpful descriptions for the other tools. 	1
3	Progress Review	<ul style="list-style-type: none"> • Students have access to view their progression through course readings and activities and current grade information. 	1
4	Searching Within Course	<ul style="list-style-type: none"> • Students can search all course notes, discussion threads, and email subject lines in their course. 	1
5	Work Offline/Synchronize	<ul style="list-style-type: none"> • Students can collect and download the particular course content for offline study. • Upon re-entering a course, the student has the option to resume at the last page viewed. 	2
Teacher Tools			
1	Plan review	<ul style="list-style-type: none"> • Instructors, students, and 	1

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		teaching assistants can post course-related events and announcements in the course calendar.	
2	Group work	<ul style="list-style-type: none"> • The software supports assigning students into groups by the instructor or by random. • Each group can have its own shared group folder, private group discussion forum, synchronous tools, and group email list. 	2
3	Assessment	<ul style="list-style-type: none"> • Instructors can create true/false, multiple choice, multiple answer, ordering, fill-in-the-blank, matching, and short answer/essay questions in a self-assessments that students can take multiple times. • Instructors can import questions from existing test banks. Instructors can also create test banks and the system can use these test banks to create tests for students. • The system automatically scores multiple choice, true/false, and multiple answer type questions, can display instructor-created feedback and explanations. • Instructors can set a time limit on a test. 	4
4	Instructor Helpdesk	<ul style="list-style-type: none"> • Instructors can access the instructor manual, the product knowledge base, and the reference center. 	1
5	Online Grading Tools	<ul style="list-style-type: none"> • Instructors can view grades in the grade book by assignment, by student, and for all students on all assignments. • Instructors can create a comma-delimited version of the grade book for export to an external spreadsheet program. • Instructors can assign partial credit for certain answers. • Instructors can import and export 	6

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		<p>a comma-delimited version of the grade book from an external spreadsheet program.</p> <ul style="list-style-type: none"> • Instructors can manually edit all grades. • The grade book supports the creation of custom columns, which can contain either grade information or other instructor-determined details. 	
Administration Tools			
1	Course Authorization – Roles based	<ul style="list-style-type: none"> • Each user is assigned a role as student, teaching assistant, instructor/designer, or Administrator, with appropriate access to tools, functions and information. 	1
2	Registration Integration	<ul style="list-style-type: none"> • The administrator can add students to the system. • Once students have been added to the system then instructors can add them to the various courses or allow students to self-register as an option. • The instructor can add students to the course and use batch import from a text file. 	3
3	Student Tracking	<ul style="list-style-type: none"> • Instructors can get reports showing the number of times, the duration of time and date on which, and frequency with which each student or all students in a course, as an aggregated group, accessed course content, specific course units and discussion forums. • Instructors can share this tracking information with students. 	2
4	Course Management	<ul style="list-style-type: none"> • Instructors can use templates to create announcements, calendar entries, course content, course units, discussion forums, instructor biography, links, and syllabus and course descriptions. • The templates include a WYSIWYG content editor or course content may also be created offline and 	3

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		<ul style="list-style-type: none"> uploaded through a form. • Either administrators or instructors to backup/delete, download, upload the whole course website 	
5	System Administration	<ul style="list-style-type: none"> • The software's administrative interface provides for usage information such as disk usage per course and number of student accounts per course. • The administrative interface is all web-based. • The software supports local backup of a course to the desktop machine for archival or crash recover purposes. • Archived courses can be restored to overwrite another course. 	4
Subject-related Tools			
1	Dictionary	<ul style="list-style-type: none"> • An online, bilingual dictionary integrated 	1
2	Word memory tools	<ul style="list-style-type: none"> • Uses memory recalls to remind the student • Flash cards 	2
3	Hanzi writing tool	<ul style="list-style-type: none"> • Teacher the right handwriting order 	1
4	Speech recognition/synthesis/translation	<ul style="list-style-type: none"> • Change input text into another language text • Pronounce the input text out, no matter whether is a word, a sentence or a paragraph • Change voice into text • Change one language voice into another language voice 	4
Technical Specifications			
1	Instructional Standards Compliance	<ul style="list-style-type: none"> • The system provides ongoing support for open industry standards for data exchange including IMS and SCORM standards to enable interoperability, object reusability, and global portability of content. • The system supports migration by importing and exporting IMS compliant courses. 	2
2	Limitations of	<ul style="list-style-type: none"> • Number of courses 	6

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	package	<ul style="list-style-type: none">• Number of students• Number of connections• Number of instructors• the disk space requirement• Minimum memory requirement	
Costs			
1	Technical support	<ul style="list-style-type: none">• Technical support is available via web form, email, or telephone.• Technical support (i.e. Toll-free number)• Additional support services with four-hour response time and 7x24 Support options are available at additional cost.	3
2	Cost	<ul style="list-style-type: none">• Customized fee• Annualized license fee for unlimited number of students• On-going Cost<ul style="list-style-type: none">• Upgrades Fee• Training Fee	5

Appendix 2

Screening Criteria

First level screening criteria set baseline requirements and establish benchmarks for the quality of learning products, whether tools, technologies, or whole systems. Given that there are literally hundreds of vendors with products, technologies, systems, and services, it is critical that interested parties be given basic criteria and kinds of information in order to decide whether or not to participate in a proposal process. The following criteria are proposed for the first round of evaluations:

Priority characteristics

1. Cost effective, good value, practical to maintain – cost effective and good value refers to the overall pricing based on the essential and preferred functions and features necessary to deliver the learning; “practical to maintain” refers to the kinds of costs and requirements necessary to be able to deliver the learning system in a way that is user-friendly and widely accessible in a variety of venues.
2. Corporate profile such that it has a track record of doing large-scale, international projects – has the technical, management, and research resources as well as a distribution network to be able to build and to support a large, high-profile project.
3. Able to integrate add-on tools and technologies. The learning system needs to be able to support and to integrate other tools, such as specialized speech recognition, or various “voice” tools, such as online voicemail and voice chat. An “open architecture” approach is preferred.
4. Can deliver learning online, via the web. It is desirable that learning can also be distributed in a hybrid (CD and web) or via a stand-alone storage medium, such as a CD product, as well.

Preferred characteristics

5. Interoperable – tools and technologies that are built to recognized standards or specifications, and can therefore, work in more than one system, or across systems, are called interoperable; in other words, they can operate between, or in more than one system.
6. Commercial Off-the-Shelf (COTS) – recognized software commercially produced and maintained, with regularity of upgrade, version control, and corporate commitment to continuous improvement; or Government Off-the Shelf (GOTS) – produced or developed with government funds and therefore made available to other government agencies at government costs. GOTS are typically non-proprietary.
7. Has a track record of working with government agencies.

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8. Has made a commitment to building learning products to recognized standards (for example: SCORM-conformance – commitment to modularity, flexibility, content re-usability and durability).
9. Built to support both synchronous and asynchronous learning environments.

Appendix 3

Weighted Evaluation Criteria for Learning Management System

The attached matrix consists of seven overarching areas:

- Excellence in distance learning, pedagogical design
- Capacity to support collaborative learning tools
- Interface and tools to support the instructor's activities
- Administrative tools to help systems administrators to track data and report on the effectiveness of the system
- Reliable, high quality technical and customer service support of the system
- Cost-effectiveness and corporate profile
- Conformance to recognized technical standards and specifications



Appendix 4

Definitions

In today's ever-changing world of technology, definitions - even technical definitions - are often relative to the context. Although there are certainly recognizable similarities, how a product is constructed, deployed, customized, and used can vary so greatly that assumptions and definitions are critical to ensure accurate understanding of what a technology is, what it "promises" to accomplish, and what the real-world experience is.

The following is an initial list of terms with beginning definitions to assist the E-Language program so as to ensure common understanding and consensus.

The majority of definitions are based on research from papers found in the ERIC Clearinghouse - a research site for educators. Refer to:
<http://www.elrnnetwork.com/eric.html>

(in alphabetical order)

blended (hybrid) model - in learning technology a blended, or hybrid, model refers to a combination of technologies, tools, and distribution modes, designed to serve the learner's diverse needs in the most appropriate manner. Example: a combination of web and DVD storage and delivery of learning content.

browser - a software program that provides a framework to search, explore, discover, and "browse" the World Wide Web. Examples: Netscape, Internet Explorer.

content management - how the content, or materials, are organized, and/or how the materials need to be organized in order to be delivered through a content distribution system (sometimes called a content management system). Materials can come in a variety of formats, such as text, assessments (tests), video, animation, graphics, spreadsheets, data, and so on. Quality content management addresses levels and degrees of interactivity, breaks down content in to "objects" that are directly associated with learning objectives. Quality content management systems track and relate learning objectives to discrete learning objects. Content needs to be designed so as to take advantage of the most desirable characteristics of quality content management systems.

evaluation tools - formalized ways to analyze, compare, and determine the features and functions of technology. Examples of tools can include comparative matrices, software testing products, and checklists for analysis and decision-making.

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instructional/learning requirements – traditionally, learning requirements were associated with learning objectives. Learning requirements have evolved to include additional readiness, technical and learner profile needs. Learning requirements continue to be grounded in measurable learning objectives, but they now tend to look at all of the elements of a learning system.

interoperability – the ability of either software or hardware, located on different machines, and developed by from different vendors, to share data.

knowledge management – sometimes used interchangeably with the term, content management, knowledge management is a broader term that encompasses content management. Knowledge management tends to include more data and administrative functions, such as the tracking of a student's progress through a series of lessons, plus other kinds of systems reports on the status of an entire program(s).

learning management system (LMS) – a software product that provides a variety of features and functions. LMS' vary widely from ones that focus on the administrative functions to those that provide both content management and administrative functions. Other LMS also include portals and add-on features. To be competitive, a number of LMS have evolved in to what are in effect, knowledge management systems (KMS). Examples of LMS are: Blackboard, Virtual Schoolhouse, Atlas Pro.

learning tools (technology-based) – software programs that are integrated in to a system, that are add-ons, that are stand-alones that can be linked in to a system, or that are plug-ins which may require some technical knowledge on the part of the learner. Examples typically used in a K-12 environment include: multimedia encyclopedias, interactive books, graphic organizers, writing assistants, multi-sensory games software, as well as the more common word processing tools.

open architecture – An architecture whose specifications are "open" to the public, as opposed to proprietary, or closed. In the definition in webopedia the following is underscored: "The great advantage of open architectures is that anyone can design add-on products for it. By making an architecture public, however, a manufacturer allows others to duplicate its product. Linux, for example, is considered open architecture because its source code is available to the public for free. In contrast, DOS, Windows, and the Macintosh architecture and operating system have been predominantly closed. Refer to: <http://www.webopedia.com>

open source – refers to a set of principles related to the access, distribution, and redistribution of source code. Characteristics of an "open source" approach include free redistribution, access to the source code, allowance of the

modification of derived works, and the license for use must not be specific to an individual product. For more refer to <http://www.opensource.org>

platform – the most common definition is simply the operating system. Examples: Windows (sometimes called PC), Mac, Linux, or Unix. The Windows, or PC platform, dominates about 95% of the market, although the Mac still dominates K-12 education. The choice of platform affects the choice of browser. This, in turn, affects text size, monitor colors, and multimedia speeds. For example, PCs have tended to have a screen resolution of 96ppi (**P**ixels **P**er **I**nch), while Macs have screen resolutions of 72ppi. That means that text appears significantly larger on a PC than it does on a Mac. In a hybrid model technical capabilities and how they all work together affects the learning outcomes.

readiness (readiness criteria)– the concept of readiness has emerged as a significant factor, especially in virtual or distance learning environments. Virtual environments, especially among non-adults, have significant retention rate issues. One way to mitigate this problem is to address the readiness issues in the initial design. Readiness can refer to the technical literacy of the learner, the instructor, or the administrative support staff. Does the learner have the skills to participate without any training or instruction in the use of the tools? Readiness can also refer to attitudinal considerations. Are the instructors, tutors, learners, or administrative support staff of a mind to be persistent in the face of technical or other difficulties? To what extent is it essential to provide “help” resources, technical “just-in-time” support, tutorials, or set prerequisite “performance indicators” to ensure maximum success of the learners?

SCORM - Sharable Content Object Reference Model; provides a framework to enable content, technology, and systems to “talk” to each other. The SCORM is a collection of specifications adapted from multiple sources to provide a comprehensive suite of e-learning capabilities that enable interoperability, accessibility and reusability of Web-based learning content. The SCORM “is built upon the work of the AICC, IMS, IEEE, ARIADNE and others to create one unified ‘reference model’ of interrelated technical specifications and guidelines designed to meet ... high-level requirements for Web-based learning content. The SCORM includes aspects that affect learning management systems and content authoring tool vendors, instructional designers and content developers, training providers and others.” Refer to <http://www.adlnet.org>

search engine – a software program that allows the user to find words, definitions, locations, and various media materials. Examples: Ask Jeeves, Google, or iTools. Different search engines allow for different kinds of searches; three examples of types of searches include: key word, URL, and full text. Refer to: <http://cui.unige.ch/meta-index.html>

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standards – there are various standards applied to the different elements of a system. Standards can refer to learning standards, content organization and design standards, systems standards, interoperability standards, and so on. Standards-setting bodies include: IEEE and ANSI. Other organizations make recommendations regarding specifications and guidelines prior to de facto practice being integrated and formalized in to standards. IMS and SCORM are examples of consortia that make recommendations regarding “best practices.”

whole system approach – “best practices” approaches foster what is called a “whole system” approach. A “whole system” approach considers all of the technical and functional elements, clearly identifies dependencies and interdependencies, and then designs a system so as both to acknowledge the complexities of interdependency while fulfilling as many of the project objectives as are “doable.” This approach is especially important when dealing with the complexities of learning technology where only a few minor incompatibilities can mean not only costly expenses in time and resources, but more importantly – learning dissatisfaction and ultimately programmatic failure.