

CRITERIA'S FOR E-LEARNING DELIVERY PLATFORM (ELDP) FOR OPRN AND DISTANCE LEARNING

Kanesan Muthusamy (kanesan@oum.edu.my)
Mansor Fadzil
Open University of Malaysia

ABSTRACT

Open and Distance Learning (ODL) has been widely discussed by academicians and Information Technology (IT) personnel's in recent years. In an ODL system, E-Learning Delivery Platform (ELDP) plays an integral part that ensures learning materials delivered to users in the most effective and efficient manner. Identifying the selection criteria's is very important and vital for a suitable ELDP system that will enhance and enrich the ODL. At the same time, evaluation formats or check-sheets can be developed using the criteria's to evaluate various ELDP providers by the ODL provider. The criteria's can also be used to help the ELDP developer or provider to develop new systems and make further improvements from time to time. This paper gives a brief summary of the criteria's to select an ELDP system for delivering education via ODL environment. The criteria's are required to satisfy the requirements for courses such as arts, social science, business, management, IT, engineering, science, and so on. It also represents the multiple perspectives of the course developer, the course learning-ware developer, the course lecturer/tutor, the course e-learning administrative staff, the technical support staff, the student and the university administration.

Key words: criteria, E-learning delivery platform (ELDP), open and distance learning (ODL)

Open and Distance Learning (ODL) has been widely discussed by academicians and IT personnel's in recent years. The foundation of any significant ODL program is its students support services and delivery system. The delivery system plays an integral part that ensures learning materials are delivered to the users in the most effective and efficient manner.

In selecting a potential E-Learning Delivery Platform (ELDP) provider, an ODL institution may have to use a wide variety of information such as self-developed selection criteria, information provided by ELDP vendors, ODL industry standard, articles, journal reports, seminars, proceedings and many others. Among this, the self-developed selection criteria are one of the key factors in choosing a suitable and reliable ELDP provider or developer that meets the organization requirement. This is because, normally, such criteria are developed from the multiple perspectives of the course developer, the course learning-ware developer, the course lecturer/tutor, the course e-learning administrative staff, the technical support staff, the student and the university administration.

This paper is organized as follows. Section 2 reviews the ELDP fundamentals, concepts and well-known providers. In Section 3, we review the common selection criteria by the ODL industries. Section 4 lists the ELDP selection criteria's for ODL environment. Finally, Section 5 summarizes the paper.

E-LEARNING DELIVERY PLATFORM (ELDP)

Historically and until recently, lectures, tutorials and laboratories are delivered through the conventional ways of delivering technical education (Muthusamy, et al., 2003). With the development of Information and Communication Technologies (ICT), open and distance learning for technical education is becoming a reality. Sometimes, the use of the term *information and communication technology* to describe aspects of the delivery of education can be misleading (Ingilis, 1999). Actually, the function and role of the ICT is to transmit information in the most effective and efficient manner. The commonly used ICT in ODL environments are electronic mail, CD-ROM, ELDP, teleconferences, video conferences, and so on. Among these, ELDP is the latest, well-known and preferred ICT tool that is being used by the ODL providers in delivering open and distance education. It is also sometime known as Integrated Learning System (ILS), Course Management System (CMS) and Integrated Course Management System (ICMS).

An ELDP is used by an ODL institution for the delivery of teaching and education materials to the students. This can be for drill and practice as well as for teaching new concepts (Selinger, 2001). It uses a *mastery* approach to learning in which each student is provided with a series of tasks to master in order to make progress to the next series of tasks. The tasks are sequenced according to an expert's notion of hierarchical difficulty, and the assumption is that, with correct teaching and sequencing, the student will be able to master the concepts and hence make progress. There are hundreds of ELDP providers available in the market today. Among the famous and well-known providers include Blackboard, WebCT, LearningSpace, Top Class, E-Web, The Learning Manager, Virtual-U and many more.

COMMON CRITERIA'S

Well-structured criteria's are very vital for the development of a good and effective ELDP that will enhance and enrich the ODL. It will help the ELDP developer and provider to make further improvements from time to time. So far, very little research has been done on the criteria's. Below are some of the recommended ELDP criteria's in ODL industries (Belyk, 2002):

- Cost
- Complexity (user focus)
- Control
- Clarity
- Common Technical Framework
- Features

The following sections will discuss in detail of the above criteria's.

SELECTION CRITERIA FOR OPEN AND DISTANCE LEARNING

Open University Malaysia has been successfully offering and conducting ODL courses since August 2001. Our courses range from marketing, finance, business, science, arts, education,

communications, information technology & multimedia and engineering. The level of education is at diplomas, degrees and masters. Very soon, we will be offering courses at doctorate level. At present, our university is using an internally developed myLMS ELDP or course management system. However, continuous improvements are needed to fulfill our ongoing and future challenges and requirements. In order to achieve this, ELDP criteria's must be updated and improved continuously. The criteria's are very dynamic whereby changes will be made from time to time according to ICT developments, ODL institution and user requirements, and any paradigm shift in the ODL education. It can also be used to help the ELDP developers to make further improvements as needed.

As we had mentioned earlier, until recently, lectures, tutorials and laboratories are delivered through the conventional ways of delivering technical education. The development of ICT paved the way to deliver technical education via ODL. Of the lectures, tutorials and laboratories that are required for technical courses, laboratories pose the greatest challenge in the ODL environment (Muthusamy, et al., 2004). It is recommended that lectures and tutorials are better conducted by combining the two into *interactive elearning sessions* (Kumar, 2002). As such, it is very timely for the ELDP developers to incorporate options to accommodate or integrate features such as interactive e-learning sessions, virtual laboratories, e-experiments, online experiments, animated experiments, etc. in their delivery system.

The following section will describe the main criteria's for selecting an ELDP for the ODL environment.

Budget and Cost Factor

As usual, budget and cost factor will be one of the most important and prime criterion for any selection. If an ODL institution do not have enough budget allocation, it is highly impossible to implement or upgrade a delivery system. Likewise, if cost of the system is too expensive, an ODL provider may find it economically not viable or too costly to sustain and maintain its operation. Similarly, users may not able to fully utilize and maximize the features provided if they are required to invest on additional hardware, software and bandwidth requirements. Items to be considered are:

- ODL provider hardware, software, infrastructure requirements (servers, software and hardware tools to be purchased or installed)
- Manpower (IT specialists, webmaster, network administrators required to maintain the system)
- Standardization (entire campus or school, department, faculty dependent)
- Hidden costs
- User hardware and software requirements (terminals, multimedia, webcam, tools, operating system, processor speed, memory, HDD space, cost burden to the learner)
- Bandwidth requirements (modem, cable, ADSL, T-1, T-3, etc.)
- Access and licensing fees (base price, scaled per student, per class, per instructor or to other demographic criteria)

System Administration

ELDP system complexity will determine the administrative and technical support requirements. Managing and controlling a system is essential for sustaining and progressing in any business. So, an ELDP system must be designed for good control and management. Issues to be considered include:

- Technical support (24×7 technical support, backup and mirror service)
- Location (server)
- Ownership (source code, contents)
- Reliability (software and system longevity)
- Maintenance (on-site maintenance and repair of systems)
- Duration (how long it takes to roll out)
- Training (train-the-trainer, learning curve, just-in-time learning)
- Protection and secured access (password-protected logins, encryption, firewall, hackers control, administrator control, volatile to virus)
- Personalization and customization
- Privacy (protection by parental/teacher controls, banners, cookies, popup advertisements)

Customer Service

As a responsible ODL provider, any problems that arise due to delivery platform must be solved as quickly as possible. If not, it can dissatisfy customers and lead to high attrition. Due to this, it is very important to pay good attention on ELDP provider background and their customer service. Factors to be considered are:

- General background (number of years established, longevity)
- Support centres (local, regional, authorized agents)
- Experience (number of expertises, any freelance developers, number of similar projects undertaken)
- Financial background (PNL report, public listed, etc.)
- Reputation in ODL industries (good track record of completing project on time, customers list)
- Recognition (awards and honours received – TQM, ISO, Malcom Balridge; industrial rating – top 3 or 10 or 100, etc.)
- Research and publication (articles, journals, proceedings, books, conferences, seminars)
- Demos (samples and prototypes shows high quality, free-trial period)
- Response time (on problem reporting, cycle time in problem solving)
- Changes and revisions (how often being made, responses on changes and revisions request)

User Friendly

An ELDP system complexity will influence the user participation and interaction. The system must be extremely intuitive for students and instructors to use. If the system is too complex and not user friendly, they may resort to conventional ways and it will increase the dissatisfaction and attrition rate. Factors to be considered are:

- Technical support (user manual, FAQ, online and offline help)
- Asynchronous tools (email, bulletin board by course, SMS)
- Synchronous tools (chat, audio conferencing, whiteboard, virtual networking)

- Iso-synchronous tools (desktop video conferencing)
- Usability (seamless technology, degree of intuitiveness, ease of use, intelligent navigation, bookmark, consistency, stability, functionality)
- Clarity (resolution, animations, sound, size, good layout)

Common Technical Framework

In a dynamic ICT world, an ELDP system must be structured and designed for existing and future technologies and standards. If not, it will become outdated soon and unable to make any integration, further modification or improvements. Factors to be considered are:

- Interoperability (ability to work together on a different systems, compatibility, platform and database independent)
- ODL and common protocol or standards compliance (IMS, W3C, IEEE, ISO, SCORM, etc.)
- Scalability (expansion)
- Platform (various type)
- Integration and support (virtual laboratories – computer aided design, analysis, manufacturing, etc.; student management systems; online books; e-contents; journals; partner institutions)
- File-sharing

Features and Tools

Features are needed to fulfill various requirements by schools, departments or faculties. It is also very dynamic whereby additional features are developed and added by the ELDP provider from time to time. The details are:

- Learner tools (virtual library; virtual laboratory; virtual hallway; instructional games; search; references and links; glossary; spellchecking; formatting; mathematics formula features - MathType; attachments; upload/download files; self-assessment; registration – subject registration and withdrawal; selecting tutors; test, quiz and examination results/grades)
- Instructor/teacher/tutor tools (student assessment – assignments, quizzes, tests, marking, selection and reporting; student management system; mathematics formula features – MathType; import and export files – into MS Excel, Word or Lotus; student tracking – attendance, on-line participation, progress; course evaluation, survey and feedback)
- Courseware developer tools (content development, modification and improvement – intelligent development tools in engaging learner materials; file conversion – HTML files, text files, graphics, PPP, audio and video)
- Administrator tools (registration; report generation; finance – fees, payment, scholarships, student account information)
- Multilingual (able to choose languages)

Proprietary Tools

Sometime, the ELDP developers and providers inclined to use software engine like *black box* or have created proprietary development languages or models that enable them to reduce the time and cost of program development. While this may cut development time for the ELDP vendor, it also means to the client, the ODL provider, will have to always return to the same company for future updates and changes, even if they are dissatisfied with the prices or service. The ODL provider will be forever shackled to the vendor who may or may not even be

in business two or three years from now when the changes are needed. It is recommended to pay special attention to ELDP vendors who are using common tools of authoring language such as *Macromedia Authorware, Director, Toolbook, IconAuthor, Quest*, and etc.

Intelligent ODL Pedagogy

Last but not least, intelligent ODL pedagogy is one of the futuristic aspirations to be achieved by an ODL institution. One of the intelligent features that ought to be incorporated in an intelligent ODL pedagogy is the intelligent technique for managing *collaborative learning*. The term *collaborative learning* refers to an instruction method in which students at various performance levels work together in small groups toward a common goal. The students are responsible for one another's learning as well as their own. Thus, the success of one student helps other students to be successful. The *collaborative learning* can further be classified into three groups, namely, *informal learning groups, formal learning groups and study teams* (Davis, 1993). At the moment, most of the ODL institutions develop their own models for managing collaborative learning among their learners. One of the issues and concerns here is that there is no clear guideline or reference model on the most efficient collaborative learning system. So far, the collaborative learning model has been left to the user to figure out based on trial and error method. When dealing with large number of students, which is a common scenario of an ODL institution, the requirements for an efficient collaborative learning model becomes a necessity. At Open University Malaysia, we have embarked on research in this area which is deemed to be an important factor in developing an ELDP system. Some of the features that ought to be incorporated are an intelligent ODL pedagogy includes:

- Group selection and size (students to tutor or discussion group)
- Interaction with resources, teachers and peers (asynchronous, synchronous and iso-synchronous tools)
- Grading procedure (online participation – evaluation, marking and grading)
- Artificial intelligence system (genetic algorithm application in gauging students intention)
- Response technique (human and personal touch towards students queries)
- Bulletin board (how to share Q&A between different bulletin board groups)

CONCLUSION

We have discussed many criteria's for a good ELDP system for the ODL environment. There could be many other features or requirements and this is not the complete one. It is a dynamic thing where continuous improvement and changes will be incorporated from time to time as the ODL industry is expected to experience many changes in the near future that are yet to occur.

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