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DESIGNING THE MILITARY ADVANCED DISTRIBUTED LEARNING SYSTEM

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Abstract: An Advanced Distributed Learning environment needs to extend beyond technical drivers to pedagogical and organizational dimensions that focus on the interaction between the learner and the learning environment. In fact, effective e-learning resources can not only be used to compliment face-to-face education or replace the classroom for distance education, but can facilitate the integration of student interaction and real-world scenarios into the learning process. The use of highly interactive and virtual resources can support authentic learning where students can relate to and experience real world contexts in their learning. This was the main road which conducted us in developing one of the most powerful ADL systems in the military education institution. This experience could be extended to the civilian corporate to serve as a guide in tentative of designing such system.

Keywords: e-learning, LMS, advanced distributed learning, learning architecture

I. GENERAL ADL ENVIRONMENT ARCHITECTURE

The Advanced Distributed Learning Initiative (ADL) was launched in 1997 as a visible commitment to incorporate into practice the benefits of technology-based instruction, generally referred to as e-learning. The goal of the ADL Initiative is to ensure access to high quality education, training and job support, tailored to individual needs and delivered on demand anytime and anywhere.

The lofty vision of ADL required a new approach to doing business, one based not on a belief of “build it and they will come” but on a belief that sustainable advances in e-learning could be best achieved through cooperative efforts.

The general ADL architecture framework is as it is shown in the figure 1. To define a business paradigm of the ADL system, we could take into consideration the principles of the Enterprise Architecture Framework. Based on it, there is necessarily to define the components: Business Reference Model, Service Component Reference Model and Performance Reference Model. These will be defined by compiling the results from the first three stages which are described in the chapter III. Consequently:

The BRM will underline the correct relationship between the organizational requirements of the military educational system (objectives and specific resources) as well as the technical structure of the basic components of an ADL Environment (Learning Content Management System, content repository, educational resources, students, tutors, Subject matter Experts, Instructional designer etc)

The SCRM is focused on bridging gaps between students' and tutors' requirements in relation to the psycho pedagogical tools in use.

PRM targets the continuous assessment tools in performing the educational process based on integrated ADL system components. Basically what this segment is meant for is identifying those tools by means of which an ADL Environment is perfectly adjustable to real needs in the educational system, by assessing results and turning these into requirements.

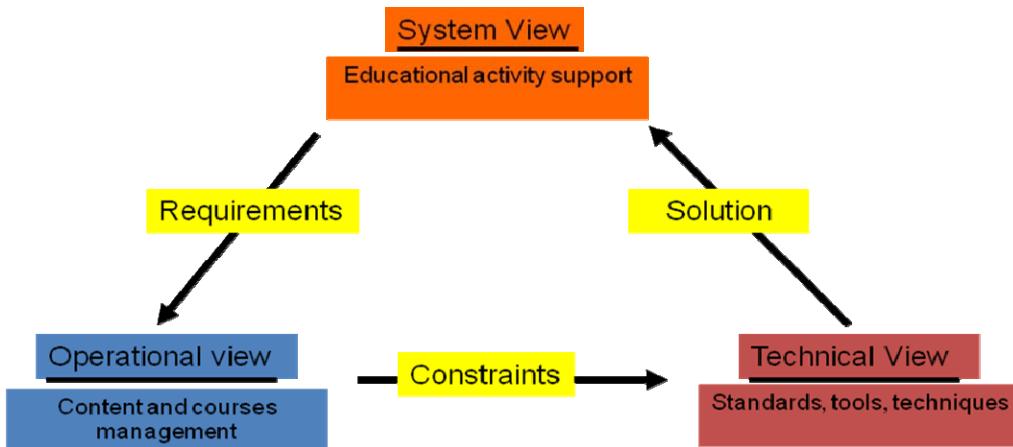


Figure 1. The general ADL architecture view

II. WHAT THE LEARNERS DO WITHIN AN ADL ENVIRONMENT NEED?

Many of the e-learning systems developed thus far, incorporate features requested by, and from the point of view of technologists and teachers. This lack of learners' perspective has led to many Learning Management Systems (LMS) being rejected or being scored low in reviews by the learners.

As in any classroom situation, in distance learning areas, there is conflict between teachers and learners regarding the most appropriate and effective didactical tools used. There is an emphasis on continuous development of existing methods of teaching in the traditional classroom situation in order to maintain the learners' attention, meet their learning needs and for them to ultimately achieve the intended outcomes. If this approach is not given equal importance within distance learning activities, some individuals will learn little that can be effectively transferred to the workplace, or even worse, may choose not to complete the course at all.

In military training activities, the situation is made even more difficult than of civilian training for at least three reasons:

1. The group of learners is very heterogeneous regarding the level of education, base background, age, specific professional skills, motivation, IT knowledge and so on.
2. The instructors come from different domains, with or without didactical experience.
3. There is a large palette of content and training objectives and no standards time for completion of courses (from 1 hour to months)

The e-learning system used to provide distance learning courses must address, in the first instance, the type of features required by the main actors of the learning activity, the learners themselves.

The ADL concept is a new and very productive one from a technical point of view but there are still many areas for improvement, especially in the didactical aspects. One of the sensitive matters is represented by the methods used to attract the learners and to meet their expectations regarding the distance training environment.

2.1. Putting the Learners at the Centre of the Process

Of course any training or learning intervention must be driven by the organization's objectives. However, the intervention will be much more successful if the learner is put at the centre of the process for achieving this. Learning is a journey, which takes time and patience and most importantly self-motivation. It is vital that the learning environment is such that it supports students to learn in the best way possible for them as individuals and so encourage that motivation and stimulus to learn.

Adults have a vast repertoire of experience which can and should be drawn on in order for them to learn effectively and to enjoy the learning experience. It makes sense then, that the existing skills and experience of individuals using the ADL environment should be identified prior to commencement of any learning and that the systems and tools used should be able to support these. A single teaching technique is not suitable for all learners and effective, fulfilling and successful learning will not take place unless individuals are provided with a variety of different techniques, approaches and environments.

Hartley identified six key cognitive principles of learning which relate to inferences, expectations, and making connections:

- a) Instructions should be well organized.
- b) Instructions are clearly structured.
- c) Perceptual features are important.
- d) Prior knowledge is important.
- e) Individual differences are equally important to learning. Each individual has different approaches of learning and cognitive styles.
- f) Cognitive feedback provides students with their success or failure.

The approach to ADL thus far, has been to look at the capabilities of the system and ‘fit’ the learners into this, as opposed to putting the learners at the centre of the process. Hartley’s key principles are unlikely to be fully addressed using this approach.

As mentioned earlier, motivation is a key factor for successful learning and assimilation of knowledge. According to Mexirow’s Charter for Andragogy, adult learners’ learn through both self-directed learning and learner self-direction (personal characteristics). Learner self-direction centres on the learner’s desire for assuming the responsibility for learning. Based on the premise that the ADL environment does not involve a teacher, it becomes even more important that the design and delivery capabilities of the system, tools and courses are able to motivate a learner to assume responsibility for their learning. An example of this is having a system which provides students with an individual learning pathway tailored to their identified needs and a comprehensive method of recording results and giving feedback.

2.2. Behavior, Attitudes, Aptitudes and Knowledge

The most commonly used model for evaluating the learning process is Kirkpatrick’s which identifies four levels which need to be measured.

- Reaction of the student - what they thought and felt about the training
- Learning - the resulting increase in knowledge or capability
- Behaviour – the extent of behaviour and capability improvement and implementation/application
- Results - the effects on the business or environment resulting from the trainee's performance

Many educators believe that ‘real’ learning takes place when there has been a change in behaviour and attitude, though this level can be difficult to measure. However, what is clear is that in order to evaluate the success of any learning intervention, there needs to be a Training Needs Analysis (TNA) carried out prior to training being developed or undertaken. This includes planning and setting up the evaluation process at the outset. In this instance, the TNA is not just to identify gaps in knowledge and skills, but to ascertain the needs of the students within the ADL environment itself. The TNA must include questions around cultural and country based differences and similarities as well as those of individual students. It is not good practice, or cost effective, to simply wait to receive results of evaluation before attempting to ‘get the system right, first time’. Questions such as ‘Why did/do some learners achieve better results than others who have experienced the same programme’ should be asked prior to the course ever being rolled out. This means carefully looking at the cohort of learners, their previous experiences, their existing skills and their needs and building the system of delivery around this knowledge. Often, the lack of success of a course and its learners is due to lack of a TNA being carried out.

Another element that needs to be considered is timing; there is considerable evidence that if a new skill or behaviour is not used within a relatively short time, the learning degrades very rapidly. The ADL system cannot be used in isolation or instead of ‘on the job’ training.

According to the Johnson O’Connor Research Foundation ‘aptitudes are natural talents, special abilities for doing, or learning to do, certain kinds of things easily and quickly. They have little to do with knowledge or culture, or education, or even interests.’ An individual will have their own intellectual ability to learn material sufficiently in order to perform their job role. However, the delivery mode or system used must be able meet their specific style or need otherwise they will be less successful at learning, hence another reason why the learners needs within the ADL environment should be identified.

The Oxford English Dictionary defines knowledge acquisition as involving complex cognitive processes: perception, learning, communication, association and reasoning. The real power of distance learning and ADL is the potential to interact with individuals who have a vast variety of experiences to share with others from their own and perhaps more significantly, other countries and cultures. This needs to be exploited to its full potential to allow for sharing of knowledge.

In the first instance, this project will seek to ultimately bring about the changes identified above, through an in depth investigation, analysis and evaluation of the learners needs with regard to the system and tools available. Instead of making assumptions as to what the learner needs, or to simply do what the system is capable of doing, it is necessary to ascertain from the learners themselves what they require.

III. STEPS IN DEVELOPING AN INTEGRATED ADL SYSTEM BY LEVERAGING THE LEARNERS` PERSPECTIVES

3.1. Learners` and tutors` profile

We should bear in mind that adults are so different in the way they acquire knowledge and that a wide array of factors are to be considered as influential in their attitude.

a. identifying types of users within the military educational environment. Different groups of users within the military will be clearly portrayed by using pre-set assessment criteria, such as: age, educational background, skill, competences, learning styles. It is important to know the spread of differences and similarities of learners. We need to make the educational process a student-centered approach, where individuals take responsibility for their own resources and make decisions about how and when to progress to the next stage. This will make the learner process more effective and efficient leading to greater achievement. We need to know who the learners are, what their existing skills and educational background are and what further assistance they might need. Likewise, tutors need to clearly identify the best training approach required based on the information collected.

b. identifying educational resources within the military educational systems. A relationship between student’s profile and educational resources will be traced. The Honey & Mumford learning styles will be considered (activists, reflectors, theorists and pragmatists) as well as the kinesthetic, visual and auditory types of learners. All this should be related to the very type of resource in focus, for the intended purpose.

c. selecting the target groups with a view to undergo scientific research on. This will be performed by means of surveys (questionnaires created for this very purpose)

3.2. Investigating educational needs and basic requirements for learners and tutors with a view to military systems educational resources.

In order to gather information on military learners’ needs to later relate it to the tutors involved, a questionnaire needs to be designed. Consequently, the following issues are to be considered:

- The would-be learners’ assessment of their previous experience, theoretical approach and educational background. The purpose at this stage is to see if the would-be learners translate their

previous experience within different environments, to the military field. If the outcome is positive, then it is an important issue to be considered at the time of Instructional Design.

- The extent to which ADL is a well known and understood concept in itself.
- A beginner's expectations in the field, in terms of technicality.

An in-depth analysis of the gathered information will be performed, in relation to initial requirements.

3.3. An evaluation- investigation session for preferences / requirements in real time situations on existing eLearning components (LMS, content, methods, systems)

By means of these activities an identification of the expressed options and a correlation with the concept of putting this into practice within already there systems is in focus. This is a mandatory step in order to do away with those requirements which are not sustained by practical reasons for accomplishment. Three different eLearning platforms will be used, with different educational content, on three targeted groups previously selected. The content will differ both in form (text, multimedia, dynamics, interactivity), standardization (SCORM 1.2, 2004, AICC) as well as providing method (self-paced, linear, sequential). The testing session will be performed on mixed groups (students / tutors) but also separately. The table below gives some instructions for doing these steps

Objectives	Actions	Techniques
Defining and developing the measurement model	<ul style="list-style-type: none"> - definition and organization of methods, algorithms and other aspects of measurement of ADL Environment Enterprise Architecture, -segregation of educational processes (e.g studies, courses, lectures, others) to properly survey and evaluate 	<ul style="list-style-type: none"> - survey/ questionnaires organization analysis; - analysis of important factors related to user-profile, latitude of influence of this factors; - analysis of known learning evaluation models; - segregation and definition of educational processes
Learner's and tutor's profile	<ul style="list-style-type: none"> - comparison specific content – specific learning objectives - define the learner profile in connection with the content and objectives - define the tutor profile - define the targets groups 	<ul style="list-style-type: none"> - curricula or training programs analyzing; National Defence Institutes; NATO and PfP Training centers and schools, others participants
Theoretical learner's and tutor's needs	Questionnaires	Applied to each target group: newbie e-learning user; experienced learners; tutors; 5- 6 countries
Prove the theoretical needs into the real existing LMS	Compare the "blind" needs with the behavior into the real existing LMS Compare evaluations tools every LMS platform	Test the ADL system based on three different LMS's in three different conditions; Ro ADL lab will manage the technical issue
ADL Environment Enterprise Architecture	Define the BRM; SCRM and PRM	Leverage the results of the steps above

IV. CONCLUSIONS

Designing of an ADL system requires a thorough analysis of the organization and its training needs. On the other hand, it takes a long term vision so that the system designed to withstand time, both from a technical standpoint and the results in training. In this article the author has attempted to

highlight just one important aspect of the problem, that of system parameters correlate with real needs and profile of beneficiaries to avoid pre-requisite rejection. Due to rapid developments in technology, technical component of an ADL can be easily solved with minor adjustments, but the systemic component is exclusively operational and organization-specific and requires special attention. In addition, greater attention must be shown how to build training content and pedagogical tools used to develop appropriate educational content specific training objectives.

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