

THE LEARNING MANAGEMENT SYSTEMS AT DAR ES SALAAM INSTITUTE OF TECHNOLOGY

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ABSTRACT

In order to increase the effectiveness and efficiency of learning, many colleges, institutes and universities have introduced eLearning. Dar es salaam Institute of Technology (DIT) is also one of the higher learning institutions, which is seriously working on implementing eLearning. It has introduced its own Local Area (Campus) Network whereby the Intranet has been established. This gives the possibility for students to access the materials within the Institute and study individually. The Institute offers different engineering disciplines.

The aim of DIT is to provide course materials through Campus Network which is made up of fiber optic cables distributed in all buildings. Therefore, it has embraced the use of Learning Management System (LMS) both for its staff and for the students. DIT is using LMS to provide these materials like lectures on campus network.

In this paper, demonstration is made on how DIT students are able to easily obtain variety of available training resources via search capabilities and calendar. The courses design; courses development and distribution procedures are also elaborated. DIT is striving on offering training materials on campus and off-campus but at this initial stage it offer on campus. The LMS that is used by DIT is called MOODLE which is the Open Source System (OSS). This (OSS) is used extensively in colleges, institutes and universities and provides facilities for students, tutors and library staff to work together and provide an information rich virtual learning environment.

This paper also highlights on structured learning programmes, access to information sources, communication tools, assessment tools, personal management tools, administrator and tutor tools. Furthermore the paper focuses on the LMS which is inexpensive and the alternative approaches that are available using Open Source to provide quality eLearning.

KEYWORDS

Learning Management Systems, eLearning; Distance Education; Continuing Education.

INTRODUCTION

Information and Communication Technology (ICT) is a term that describes the disciplines encompassing systems analysis, programming, telecommunications and multimedia applications. It is the convergence of computers and communication. The merging of computing, information, communication and technology have made ICT an essential part of our social infrastructure. Several organizations including academic institutions are increasingly using ICT for conducting their activities especially in eLearning.

ICT has changed rapidly over the past ten years resulting in a significant shift of emphasis. Computers are being predominantly used for text manipulation, surfing and electronic mail. This trend is expected to continue until members of the Institute view computers as essential tools and where information is exchanged electronically rather than physically on paper.

The status of ICT in the Dar es Salaam Institute of Technology is low and currently, the computer/student ratio is 1:5 and computer/senior member ratio is 1:3. In view of the critical role ICT plays in the educational sector of the country, it is imperative to build sound programmes and infrastructure in the Institute to facilitate its development. All the PCs in the institute are connected in the Intranet and the Internet (DIT ICT Policy 2004).

Learning Management Systems (LMS) are often viewed as being the starting point (or critical component) of any eLearning or blended learning program. This perspective is valid from a management and control standpoint, but antithetical to the way in which most people learn today. LMS' like WebCT, Blackboard, Moodle and Desire2Learn offer their greatest value to the organization by providing a means to sequence content and create a manageable structure for instructors/administration staff. The "management" aspect of LMS' creates another problem: much like we used to measure "bums in seats" for program success, we now see statistics of "students enrolled in our LMS" and "number of page views by students" as an indication of success/progress (George 2004). The underlying assumption is that if we just expose students to the contents, learning will take place.

Dar es salaam Institute of Technology established the eLearning platform on October 2004. The aim of establishing this system is to curtail the problem of teaching materials because the institute has very few books in hard copy form. It is also aimed at building the student's behavior by promoting individual studying. DIT offer different engineering courses which are: Civil Engineering, Mechanical Engineering, Electrical Engineering, Electronics and Telecommunications Engineering, Computer Technology as well as Science and Laboratory Technology. In parallel with the establishment of eLearning Platform in October 2004, the Institute started the Bachelor of Engineering (BEng) Degree.

LEARNING MANAGEMENT SYSTEMS

Learning management systems provide end users with a single point of access to disparate learning objects and components.

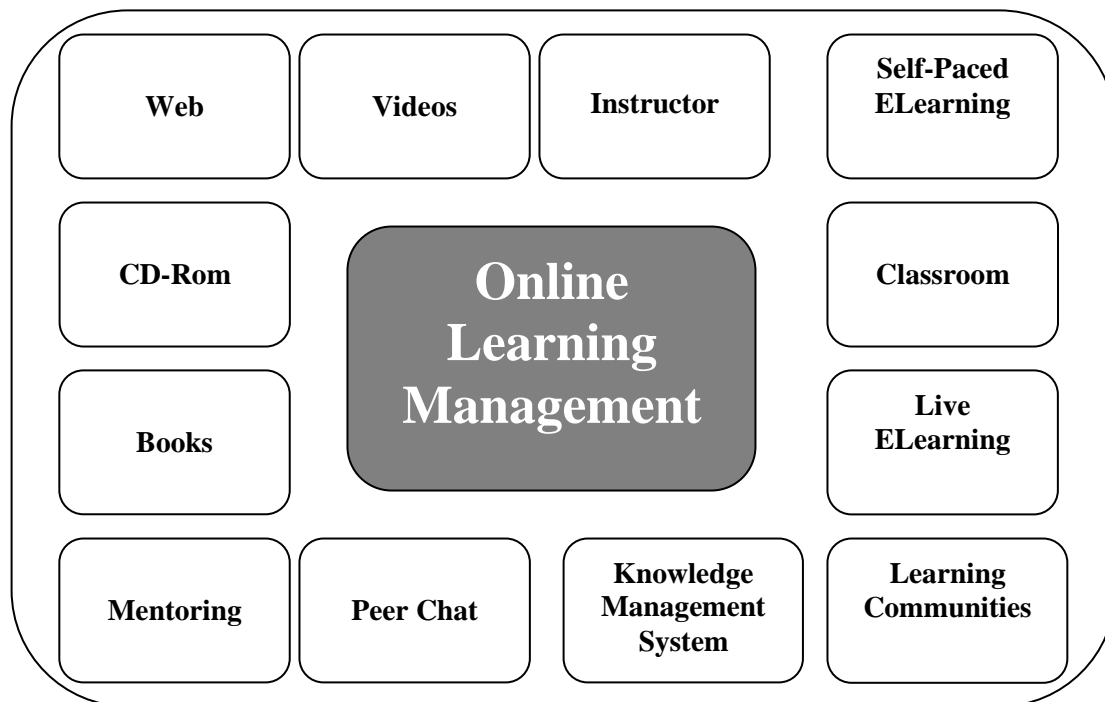


Figure 1. Content accessed via the Learning Management System

The Learning Management System is designed to support the management of learner performance by tracking progress and performance across all types of learning activities. It also has functionality for management, administration, and measurement of learning. Typical functions and processes supported by an LMS include:

- Managing courses and course registration
- Tracking student registration, access, and progress
- Managing course information
- Course scheduling and administration including instructors and physical facilities
- Reporting

From a technical perspective, the LMS is the software that links together and integrates all the other software components that make up the technical solution, integrating also with existing Institutional Resource Planning (IRP) applications, such as financial and human resources. The LMS provides two fundamental capabilities:

- Learner self-management, access, and administration of self-paced eLearning, virtual classroom, and classroom-based learning and support
- Training administration, including training records and curriculum management, course publishing, tracking, and reporting, and competence management

An LMS ideally provide functionality to manage events ranging from classroom-based instruction to offline media such as CD-ROM, and online eLearning with a clear area of focus. For examples, an LMS initially developed for management of classroom training will include more functionality around the management of physical training assets, including classroom, course materials, instructors, and other types of inventory. On the other hand, the LMS developed for administration and assignment of eLearning components will include less, or sometimes no functionality, for managing physical facilities, but will provide a much more extensive array of services of tracking access to content and launching content, and will accommodate Web-based, network-based, CD-ROM-based content. A key factor in determining the right LMS for the enterprise is the portfolio of content platforms that must be supported by the technology architecture.

Today a major decision is to whether to integrate best of breed eLearning packages, or to utilize the emerging learning applications and solutions which are part of enterprise and infrastructure application suites. Over the past two years, the leading enterprise software companies, including SAP, PeopleSoft, Oracle Corporation, Siebel, and Sun Microsystems have introduced significant applications covering a range of learning management and content management capabilities. For companies with an enterprise software platform, especially in the human recourses (HR), portal, and infrastructure areas, serious consideration should be given to these learning applications.

These solutions are designed to integrate with the HR, information system (IS), and finance systems, as well as with the core underlying technology infrastructure. Since 2000, the leading enterprise software companies have accelerated their investments in these offering including acquisitions of smaller eLearning technology players. This consolidation and the role of enterprise software companies in the learning technology market will continue and become more critical for larger companies as integration, maintenance, and support increase in importance.

While Saba, THINQ, Click2learn, Docent, and Vuepoint are perhaps the most prominent best-of-bee LMS providers, there are other successful entrants into this technology space include Anlon, integrity eLearning, IntraLearn Avantis Jupiter Suite, Knowledge Planet, Knowledge Solutions (UK), Pathlore, and WBT System.

A key consideration in selecting an LMS provider may be also the organization's ability to deliver the LMS using an application service provider (ASP), which uses secure networks to provide LMS capabilities to small and mid-size firms. Some firms choose an ASP offering and host LMS and content are Generation 21 Learning System, Saba Software, Inc., and THINQ Learning Solutions, Inc. An ASP solution may provide a welcome alternative to organizations whose existing technology infrastructure and bandwidth cannot support the technical requirements of a more traditionally hosted LMS.

LEARNING CONTENT MANAGEMENT SYSTEMS (LCMS)

The Learning Content Management System (LCMS) typically contains four essential features: an authorizing application; a collaboration of learning objects (called a repository); a means of sending the completed course to a delivery system called a delivery interface); and administration tools. The LCMS provides authors with the ability to locate existing learning objects, create new learning objects, and assemble them into standards-compliant eLearning courseware.

The advent of the LCMS is much more recent than that of the LMS, but is gaining significant press and attention for those organizations attempting to build a common and centralized repository of learning content that can be shared and accessed by both the designers and learners. The ability to decompose traditional learning object areas is very compelling for sophisticated eLearning providers.

The LCMS stores online learning content in a central learning object, which are managed primarily in the form of XML. These objects are often delivered on the basis of a learner profile, thus enabling highly personalized, just-for-me learning. These learning objects are provided to the learner in a composite format on a just-in-time basis to address a specific learning need, and permit reusability across various learning interventions, ranging from online to offline, and from self-paced to collaborative learning. Therefore, those organizations with an interest in creating well designed blended eLearning programmes would be well advised to explore the capabilities of learning content management systems.

LIVE ELEARING TOOLS

Today, learners of all ages, from preschool through university and beyond in the corporate environment, are participants in learning programs that are delivered over computer network.

Live eLearning, also frequently termed synchronous, marries the beauty and benefits of classroom learning with the sophisticated technologies available through Internet technologies. Live instructors have the ability to engage groups of students in multiple geographic locations and time zones simultaneously, while eliminating the cost of travel and accommodations for the learner. These virtual classrooms are increasingly replacing physical classroom training, as more and more vendors provide increasingly advanced features and functions to enhance the attractiveness of the overall learner experience. Students have the ability to raise their virtual hands, ask questions, chat, and share their own documents and deliverables, often never leaving the comfort of their home, office or learning studio.

Most live eLearning technology providers have developed products that include capabilities to:

- Manage group discussions
- Facilitate small group breakouts
- Share applications
- Conduct pre-, ad-hoc, and post-assessments
- Explore intranet and Internet Web sites
- Provide handouts

- Conduct private and public chats
- Prepare and edit recordings of the session for those unable to attend live sessions
- Offer voice over IP
- Provide one- or two-way video

Most live eLearning products are designed to run over a standard Web browser and make use of its Java capabilities for various functions, with the majority designed to operate on either of the two dominant browser platforms (Don M, 2004).

COLLABORATIVE LEARNING TOOLS

Collaborative learning tools are technologies which support learning through the exchange and sharing of information and knowledge among learners. These tools support the principles of collaborative e-based learning through real-time document sharing and editing, discussions forums, brainstorming and idea generation, multimedia documents and group productivity. Various studies show that learners who work in collaborative groups appear more satisfied with their learning. Communication and conversation are among the keys to learning (Nicholas 2004).

INFRASTRUCTURE NETWORK DEVELOPMENT AND CONNECTIVITY

The institute has a reliable high speed campus network which builds the backbone communications network. DIT campus network is used for providing staff and students with connection to both national and international networks.

With the development of multimedia technology and the increase in computing power (speed) of the PC, demand for higher communication network speeds and different networking techniques may be needed. In this direction, the Institute is taking appropriate steps towards securing funds for direct investment in VSAT (Very Small Aperture Terminals) technology. So far all departments are connected using fiber optic cable.

MOODLE

The word Moodle was originally an acronym for Modular Object-Oriented Dynamic Learning Environment, which is mostly useful to programmers and education theorists. It is also a verb that describes the process of lazily meandering through something, doing things as they occurs to you to do them, an enjoyable tinkering that often leads to insight and creativity. As such it applies both to the way Moodle was developed, and to the way a student or teacher might approach studying or teaching an online course. Anyone who uses Moodle is a Moodler.

Moodle is a software package for producing internet-based courses and web sites. It is an ongoing development project designed to support a social constructionist framework of education. Moodle is provided freely as Open Source software (under the GNU Public License). Basically this means Moodle is copyrighted, but that you have additional freedoms. You are allowed to copy, use and modify Moodle provided that you agree to: provide the source to others; not modify or remove the original license and copyrights, and apply this same license to any derivative work. Moodle will run on any computer that can run PHP, and can support many types of database (particularly MySQL).

The Moodle Learning management systems that DIT adopts provide end users with a single point of access to learning objects and components. Based on figure 1 which is the standard platform, DIT platform has

achieve the following thing toward achieving total eLearning Platform which must have the capability of replacing the traditional way of learning where a lecturer has to present physically in the classroom: Our platform is not having video material (contents) online, live eLearning, there are few online instructors and mentoring. To some extent it has self paced eLearning capabilities.

DIT COLLABORATION WITH OTHER LEARNING INSTITUTIONS IN eLEARNING

DIT is an Institute that specializes in training technicians and engineers. It offers Full Technician, Advanced Diploma Certificates and Bachelor of Engineering Degree. The Institute is in the process of starting to offer the online courses in collaboration with other universities. The course on Masters in Facilities Management is starting on February 2005. This course is being conducted in collaboration with Leeds Metropolitan University (LMU). In this course the LMS that is going to be used is WebCT. In partnership with the Dar es Salaam Institute of Technology (DIT), eDegree South Africa are in the process of setting up an eDegree administrative and technology centre in Tanzania. DIT will be the official technological support centre for eLearning students.

The courses on offer will be from:

The University of the Free State's: B.Com., LLB, BML (Bachelor in Management Leadership), and MBA (Master in Business Administration).

The Institute of Marketing Managers: Diploma in Marketing, Certificate in Marketing Communications and the Bachelor in Business Administration (BBA).

Reebok: Fundamental Health and Fitness Diploma, Basic Science Diploma and the Professional Health and Fitness Diploma.

The Institute of Marketing for Managers (IMM) will also offer their course through the Tanzania centre. In all these courses the LMS that is going to be used is Blackboard.

The courses will be offered online. The advantages for the students include:

- Internet based delivery of courseware
- Online academic guidance, weekly assessments and feedback by lecturers
- Dedicated staff for online support and quality guidance
- Online academic discussion forums with fellow students and lecturers (eDegree at DIT)

DIT'S eLEARNING PLATFORM HOMEPAGE

This is the front page of the eLearning Platform. It is having security feature that allow only administrator to log in the system. This administrator is having the privilege of making changes and modifying course, tutor, students and guests. The front page shows all of the courses that are available online in this platform.

The platform is having the administration features that are available through the login and password of the administrator only which are: Configuration, Users, Courses, Logs, Site files.

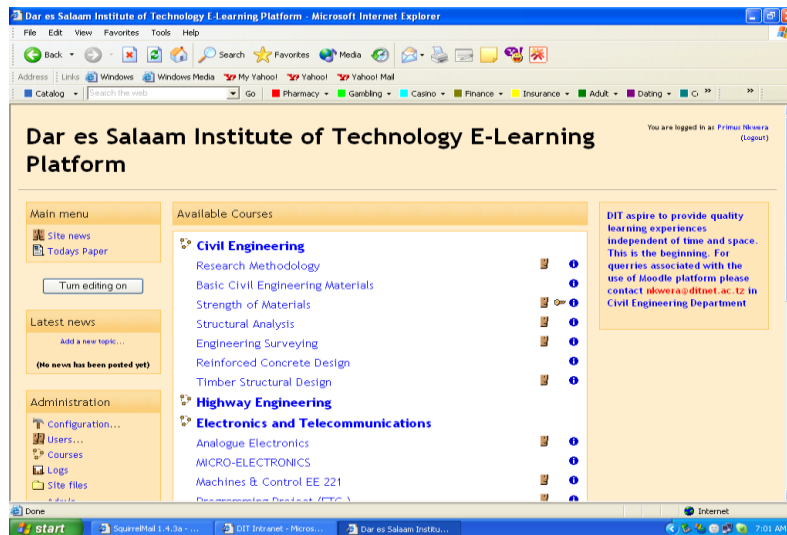


Figure 2. DIT's eLearning Platform homepage

ADMINISTRATION OF MOODLE

The administration of the platform is accessible to administrator(s) only. This is because the administrator can modify, update and delete even the courses that are available online. Among the functions that Administrator can execute on the system are as follows:

- Configuration
- Users
- Courses
- Logs

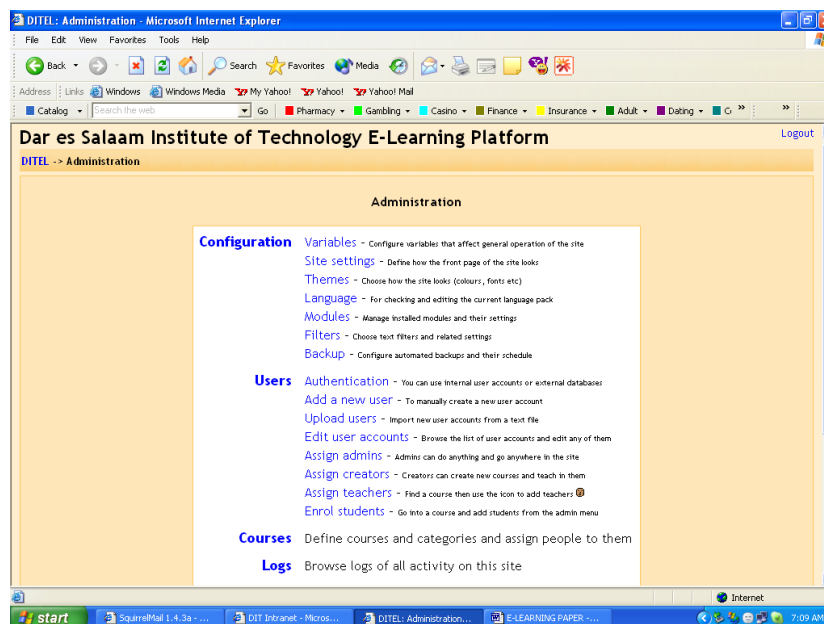


Figure3. Administration of Moodle

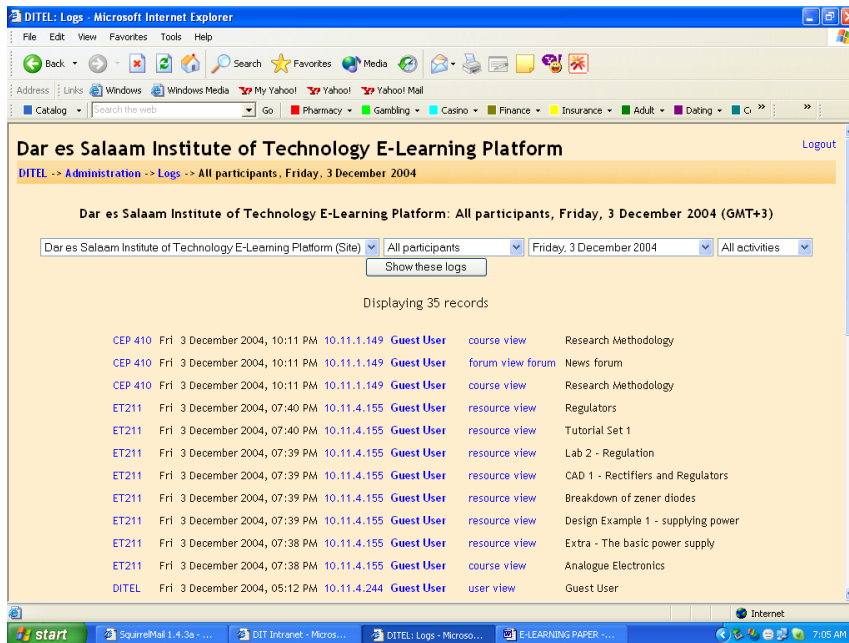


Figure 4. Live logs from past hours

COURSE VIEW

This shows the activities within course itself. It is the platform that the tutor or lecturer can use to do general management. Track the student activity. This is where one can find the calendar, notes and assignments. The Lecturer can edit the course. There is the forum. The lecturer can create groups, track the participants and edit the profile. There are searching capabilities. The lecturer has the freedom to administer and design the course and the course calendar.

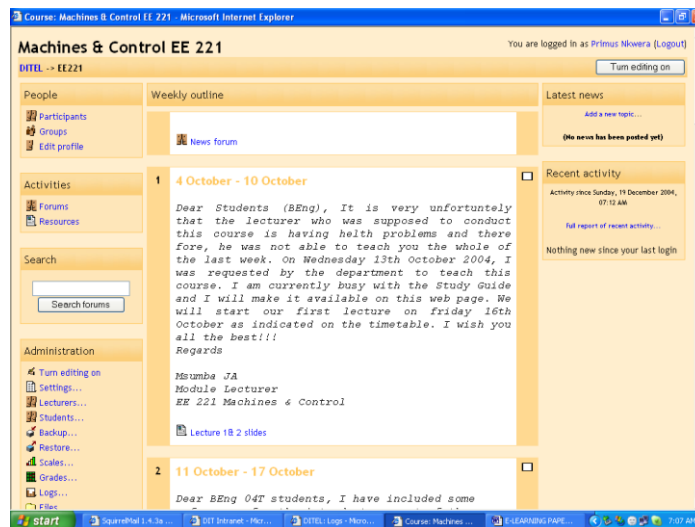


Figure 5. Course view machines and control

In order to study the effectiveness of using DIT eLearning Platform it was decided to choose some few subjects and conduct analysis. Table 1 and figure 2 shows the behavior of visits as from October to December 2004 against four selected engineering subjects.

Table 1. The Number of visits to DIT eLearning Platform as from October to December 2004

SUBJECT	NUMBER OF VISITS		
	October	November	December
Analogue Electronics	231	300	365
Digital Electronics	204	237	277
Timber Structure	190	241	231
Strength of Materials	180	198	209

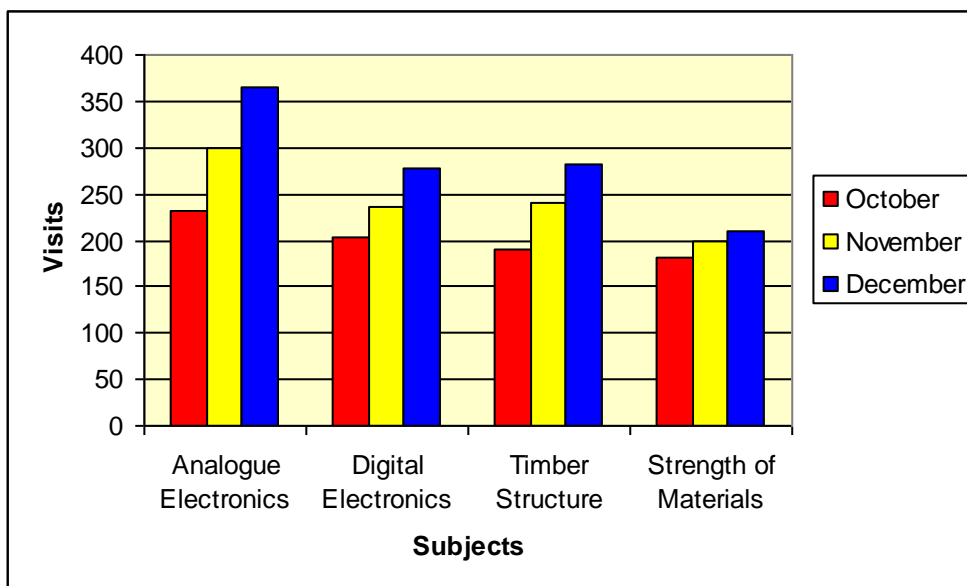


Figure 2. The number of visits to DIT eLearning Platform as from October to December 2004

The diagram shows that in the first month i.e. October, the number of visitors was small compared to following two months. In this respect the number increases as the time goes on. The reason of having this characteristic is that most of the students did not know the importance of learning through eLearning platform. Second reason is that many students and teaching staff had no enough knowledge of using computer and DIT eLearning platform. The institute is working very hard on sensitizing and educating the above named stakeholders.

CONCLUSIONS

According to John (2002), learning management system optimally should:

- Consolidate training initiatives on a scalable, low-cost Web-based platform. This is reflected in Moodle Platform since is the open source so the overall cost of the training is low.
- Assemble and deliver learning content rapidly in multiple languages. The LMS used in DIT is supporting many known languages in the world and the license allows modification or translation of the platform to any languages.

- Measure the effectiveness of training initiatives. In the Moodle platform since one can track any student's and tutor activities and their participation in the platform at anytime and anywhere, this makes the job of measuring effectiveness of learning so easier.
- Mix classroom and online learning. DIT is using the traditional way of teaching in the classroom face to face. However, LMS is used as the alternative approach of simplifying the interaction between students and the lecturers. It help especially shy students to ask the questions which they couldn't ask in the classroom.
- Integrate with other enterprise application solutions. The LMS used at DIT can import and Export documents and reports to/from Blackboard and WebCT.
- Centralize and automate administration. It helps in the administration of the training process since all of the information is available anytime.
- Use self-service and self-guided services as much as possible. Since the information of the subjects in the LMS is available per department, students can decide to study any subject they want at there own pace.
- Personalize content and enable knowledge re-use. Moodle support this because it is the open source and the open source advocate knowledge re-use. Personalization of the contents is possible during registration of the student.

Therefore, the LMS that is used by DIT meets all criteria given above.

Learning Management System has assisted in measuring the effectiveness of visiting the DIT eLearning platform. The study has showed that the visitors are increasing as the time goes on which indicate that the students have seen the importance of eLearning. Furthermore, this system of learning has increased the individual learning of DIT students.

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