

Learning through ERP in Technical Educational Institutions

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Abstract- ERP has become an integral part of all technical educational institutions (TEIs). ERP system can serve as a method to obtain high integration for management system of TEIs for the betterment of increasingly complex managing operations. ERP for institutions usually support academic, administrative and research activities which helps teachers, staff, students, researchers, top management and other human resources to learn in a collaborative manner. Various forms of learning are collaborative learning, cooperative learning and e-learning. The learning is actually done through communication. This paper discusses various design principles to be included in ERP system for institutions for successful collaborative learning, cooperative learning and e-learning.

Keywords: ERP Collaborative learning; Cooperative learning; e-learning.

I. INTRODUCTION

ERP systems for educational institutions were developed for supporting academic services and administrative tasks. The main aims of ERP system include higher availability of administrative systems, integrated workflow, decreased expenses, improved efficiency, better information access for planning and management along with improved services for faculty, staff and students. The improved services include better communication, learning and shared context. The level of efforts needed for using the services also determine the success of the ERP system. This is measured using the usability of the system. ISO standard 9241-11 defines the usability as “the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use”. Thus, the users, their goals and the context of use are a key determiner in judging the usability of the ERP system. If we analyze the definition of usability, the three key terms used for measuring usability are defined as effectiveness, efficiency and satisfaction. Better learning can provide more satisfaction, efficiency and effectiveness. There are three different terms used for learning: collaborative learning, cooperative learning

and e-learning. These differ in some aspects from each other as defined by various researchers in literature. The next sections discuss the characteristics of each and how ERP can help achieve these in TEIs.

II. COLLABORATIVE LEARNING

Collaborative learning is defined as “a coordinated, synchronous activity that is the result of a combined attempt to construct and maintain a shared conception of a problem”. [3] The collaborative learning tools are interactive chat, discussion forum and peer to peer chat. The benefits which the students achieve through collaborative learning are developing interpersonal coordination, better listening skills and learning to work. The elements of a collaborative learning are identified as: positive interdependence, individual accountability, face to face promotive interaction. One of the framework for integrating learning companions into collaborative strategies contains a user model and an adaptive component. The user model has different features for student learning while the adaptive component helped the students in selecting the appropriate learning companion. A relation between modules for collaborative learning of ERP systems included two types of collaborative learning within the university: training based learning and work based learning. Case based learning and theme based learning is used for providing training based and work based learning. The techniques used for theme based learning are brainstorming, web based training and web based tutoring. The introduction of online discussion tools also helps in increased collaborative learning [10]. A fuzzy logic based inference system is proposed by [5] which helps in enhancing on line collaboration between the peers. This is done using a web based collaborative tool Lin2k. Carbera et al. conducted a study on users from 23 institutions. Collaborative learning had the positive effect on cognitive behavior of students [8].

III. COOPERATIVE LEARNING

The cooperative learning methods are learning together, complex instruction, group investigation, team games tournament, laboratories and projects, peer editing etc. Many

models have been suggested by researchers for cooperative learning. These include activities like climate setting, team formation, team building, cooperative skill development, classroom management etc. Weblogs are also a good means of cooperative learning. Weblogs can help users to develop literacy skills, critical thinking skills, knowledge construction ability and academic development etc. There have been various learning environments supported for collaborative learning. One example is a model of personalized collaborative ubiquitous learning environment which utilizes RFID tags to detect the surrounding physical objects and provides a social knowledge awareness map for peer helpers during learning[1]. Various quality development models have also been proposed by [13] which emphasize on focusing on student learning along with other criteria in higher education.

IV. E-LEARNING

With the advent of internet, the demand for e-learning is growing day by day. E-learning is needed due to rising e-business and e-commerce applications. E-learning is done using real time chat room, discussion forum, email support and learning through training. It refers to the use of computer network technology (like internet) to deliver information and instructions to individuals. There are many theories for e-learning. Adult learning theories form the basis for the design of e-learning practices in work environments. A performance oriented approach was proposed to e-learning in the workspace [2]. The importance of e-learning has been well emphasized for teacher development in order to meet the goals of national education [11]. A study done at higher educational institutions in North West Frontier Province, Pakistan revealed that the importance of knowledge, and beliefs in successful implementation of ICT [12]. They have suggested that there is an urgent need of e-learning for students, teachers and administrators.

V. LEARNING THROUGH ERP SYSTEM

The benefits as reported by many researchers from ERP include improved coordination and communication among all the users in the system. Ease of access to data and queries help the users better understand the functioning of the system. One of the main advantage reported from organization point of view is the common vision of the entire organization. This could even be with a changed culture. The employee's skills are broadened with training. As the information is available at central place, all can use modes of communication media like email, video conferencing, chat, discussion forum etc in the ERP system for better learning. With the help of ERP systems, TEIs can even collaborate with other TEIs to share information and projects. This can result in more enhanced collaborative learning scenarios. The use of internet services can enable the users for e-learning and cooperative learning. The proposed model indicates how the ERP can help learn in different ways in TEIs. In ERP domain, system-user collaboration has been identified as a design principle for

achieving greater usability in the ERP systems as indicated by the work done by National Science Foundation [4]. In one of the evaluation and monitoring of training given to users in ERP system, learning was found to be an important outcome [7]. Communication structure is identified as one of the major critical success factors for ERP project implementations in Romanian universities [14]. The communication culture between companies and universities has been compared in this paper. It was reported that communication in universities is difficult due to a large number of different groups, with different objectives. The need is emphasized for an open attitude towards communication and learning. Inter-departmental communication is also identified as a critical success factor.

A survey was done to identify the problems from approximately 900 ERP users in 22 different TEIs in North Indian region[15]. The users were asked to rate the severity of the problem on a Likert scale with values from 1(not severe) to 5(critical).

VI RESEARCH FINDINGS

The critical problems identified were less training, difficulty in use of the ERP system, reliance on technical assistance, less personal contact, difficulty in updations and time consuming activities. The results of the survey are summarized in figure 1 below:

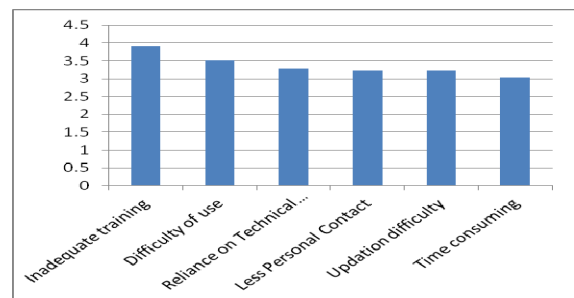


Figure 1: Problems reported in ERP users in TEIs

If we try to find the root cause of most of these problems is lack of learning skills. Lack of training made the system difficult to use and update for the users. As the users were not able to learn all the uses of the ERP system, they were forced to rely on technical assistance for carrying out day to day activities. The ERP designers can introduce the following solutions for improving the learning skills of the users of ERP systems.

There are a number of activities which should be included in ERP system for a TEI. These can be broadly categorized as academic activities, research activities and administrative activities. Number of different people are involved in these activities which need to collaborate at different levels. Various stakeholders identified for ERP in TEIs are shown in Table 1.

Table 1: Stakeholders for ERP in TEIs

Academic	Research	Administrative
Teachers	Funding agencies	Board members
Students	Consultants	Administrative staff
Staff	Vendors/Suppliers	Peer University group
Parents	Customers for projects	Online Collaborators
External examiners	Researchers	Government Members

These stakeholders aim to have a successful ERP implementation. They all may have some measures which are common for measuring the success while some of the measures may vary according to the level of use of the ERP system. However, learning is considered to be the most common objective. The level of learning may vary according to users. There are different activities carried out in these categories. These are summarized below:

1. Academic activities: The activities in ERP system include online registration, online examination and evaluation, online assignments, online inquiries and consultation, online campus recruitment information update, online payroll management, online leave management , online cultural event management system.
2. Research activities: The activities required in research area are online inventory management from vendors, online product demos, online consultation , meetings summaries, online tender notifications and online organizational or government policy updates, online status reporting for projects.
3. Administrative activities: The activities in ERP for administration include policy formations and updations, reporting mechanisms within a hierarchy, finding opportunities and terms for collaborations, summarizing costs and benefits over years and analyzing the results.

In order to carry out these, the following should be included in ERP system for improving learning:

1. Training: Proper training at regular time intervals can help the users learn in a better way in academics as well as researchers to utilize the facilities provided by ERP in an efficient and useful way.
2. Online Help: This is of help to all the users because the availability of online help can reduce the chances of wrong communication even if there is no person available for assistance.

3. Face to face interaction sessions: This is the oldest method of learning. In ERP, this can be in person or through video conferencing. This can help the universities to collaborate with many other institutions and progress.
4. Computer mediated collaboration: These all can be used for better forming a global scenario for TEIs using ERP.
5. Video conferencing: Whenever this mode of learning is available, ERP can be used in multi campus universities for better control. The researchers can also discuss useful findings with others.
6. Online information management system: This is required for providing all the users a platform to enter the information through ERP interface and hence can be used by all others who need it.
7. Regular updates on websites: Websites can serve as a dynamic way to get the latest updates and hence better learning about the changes in policies or result notifications etc to take proper decisions. The reports posted on websites can also help in better learning and decision making.
8. Important communication through mobile phones (through SMS/fax): This provides an instant method of communication in case of emergency. This can well be used by parents or administrative people for better management.
9. Online reporting mechanisms: This can be of great help for researchers and top management. All the reports can be stored in ERP system and made available for ready reference.
10. Using e-mail: This is considered as the cheapest method for communication both formally and informally.

Though all these methods are good ways of communication and learning , these cannot be used at all levels in ERP. The following figure shows the places where these can be included while designing the ERP system for TEIs.

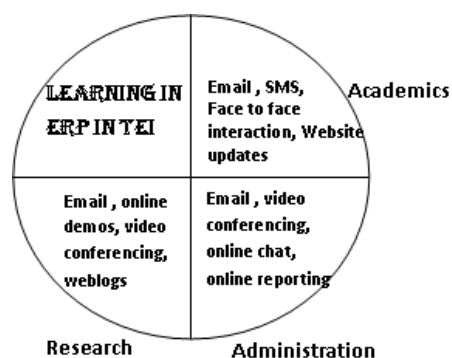


Figure 2: Learning in ERP in TEIs

CONCLUSION

Learning is an important consideration for successful ERP implantation in technical education institutions, higher education institutions and universities. Without communication, learning is difficult to achieve. A number of methods have been proposed in this paper to enforce proper communication between various users of ERP system in TEIs which can lead to better learning environment in higher education as well as the system. Computer mediated collaboration can also improve knowledge sharing and knowledge building within the distributed community as has been investigated by Tomsic and Suthers[10]. The activities and the corresponding ways of communication which can help in learning are suggested here. The problems identified from the survey can be handled easily using these suggested measures. All the TEIs who wish to achieve success in ERP projects should include these in their design.

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