**Design and Development of E-Learning Platform and Faculty Profile System**

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1. **Project Summary**

E-learning platform and faculty profile system are two technological innovations capable of reshaping the higher education and research. The objectives of this project are todesign and develop an e-learning platform and a web-based faculty profile system for the institute using open source software tools and techniques. Appropriate software applications will be selected and customized for the design and development of both the systems by making a comparative evaluation of the major open source applications in the respective fields.

1. **Introduction**

The developments in Information and Communication Technology and the resulting technological innovations are rapidly transforming the way higher educational and research institutions are conducting teaching, learning and research activities and disseminating their scholarly output. Two such important technological innovations which improve the quality of higher education and scholarship are e-learning platform and online faculty profile system. While e-learning platform is a relatively mature innovation for conducting technology-based learning activities, the online faculty profile system is an emerging innovation for showcasing the scholarly works of the faculty and researchers.

The All-India Institute of Speech and Hearing (AIISH), Mysuru is a pioneering higher education institution in communication disorders in the country. This project aims to develop a cost-effective e-learning platform and a faculty profile system for AIISH using the available open-source technologies.

Creating of the informative and educational environment today is a prerequisite for the successful implementation of the current Federal State Standard for Higher Education (hereinafter – the Standard) and of accreditation requirements of the educational organization and the provisions of the Order of the Ministry of Education and Science of the Russian Federation of April 5, 2017 № 301 "On approval of the organization and implementation of educational activities on educational programs of higher education – bachelor's degree programs, specialist programs".

The virtual learning environment (VLE) has grown to become a piece of complex infrastructure that is now deemed critical to higher educational provision.

1. **Literature Review**

Unfortunately, the number of scientific and pedagogical research and works on the use of information technologies in the implementation of foreign language education in non-linguistic universities are still insufficient.

* 1. **E-learning**

A variety of terms are used to refer to learning that occurs using technology as a means to deliver and facilitate learning. These include “e-learning”, “online learning”, “web-based learning”, “web-based training”, and “distance learning”, among others (Moore, Dickson-Deane & Galyen, 2011).

Educators themselves do not always agree on what these terms mean or how they are defined (Moore et al., 2011).

Khan (2001) defined E-learning as anything that includes technology with interactivity to support learning, training and communication between groups and between individuals.

Kenan et al (2011) stressed the need for enhancing the student computer skills, and capacity building for instructors before implementing e-learning courses.

They provided a set of

recommendations for students and instructors to improve e-learning in Libyan HE institutions as follows:

 Improve students’ computer skills before enrolling E-learning course;

 The attitudes towards e-learning should be taken into consideration.

The authors provided recommendations for institutions as follows:

 Instructors should be offered adequate training and course developers to be updated on changes to software and hardware.

**2. Objectives of the Project**

The main objectives of the project were to design and develop an e-learning platform and a web-based faculty profile system for the institute using open source tools and techniques. The specific objectives were:

1. To provide an open, flexible and reliable educational technology base for the Institute
2. To create a blended learning environment conducive for both the learners and educators
3. To develop e-learning resources and tools that meet the educational requirements of the Institute
4. To address the need for capacity building in e-learning technologies among the faculty and students
5. To formulate a policy on the adoption and use of e-learning system for the Institute
6. To capture, preserve and disseminate the Institute’s collective scholarly works and transform scholarly communication
7. To create an integrated and dynamic web-based record of scholarly output of the Institute

**Research work flow**

**Participants:**

The two pilot studies included –

1. 60 students of M.Sc.- SLP &
2. 13 students of I B.Ed.Spl.Ed. (HI) programme

**Materials:**

The research outcomes involved development of the following products –

1. E-Learning Platform

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1. Faculty Profile System

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1. Faculty training manuals

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**Method:**

The project was undertaken in two streams involving development of e-learning platform and building up of faculty profile system for effective implementation. The same flow of work undertaken has been outlined herein under:

Phase 1: E-Learning Platform

1. Appropriate software for the development of e-learning platform was selected through a comparative evaluation of the major open-source learning management systems including Moodle and ATutor. Criteria like community support, compatibility with the existing instructional support tools like Turnitin, ease of access and facility for uploading of content including completed assignments by the students from off campus locations were considered while evaluating the candidate software applications.
2. Beta installation of the selected software on a temporary system with limited computing power and customization of the software tools as per the requirement was carried out.
3. Pilot users from among the faculty members were selected based on their experience in using eLearning platforms and tools and obtaining feedback, and consent for participation.
4. A few trial courses using the core features and facilities of the selected software were developed.
5. Training of faculty members on the content for the courses with hands-on sessions and one-on-one consultation is impending.
6. Full content for faculty training was set-up on a permanent server and integration of the software with the existing system.
7. Trial run was carried out and feedback obtained from faculty and students.
8. The system has been finalized.
9. Training for the students is impending.

Phase II: Faculty Profile System

1. Appropriate software was selected for the development of faculty profile system through a comparative evaluation of the features of major open source learning management systems including VIVO, Opus and BibApp.
2. Beta installation of the selected software on a temporary system with limited computing power was carried out.
3. Software application was customized as per the requirement of the Institute.
4. Information on faculty publication, funded research projects, classes taught and other scholarly activities were collected through questionnaire and entered into the system developed.
5. Additional profile information from authoritative institutional data sources like digital repository and external sources were imported.
6. Trial run of the system was carried out.
7. Followed by setting up of the system on a permanent server
8. Faculty were oriented and feedback obtained from them.
9. System was finalized.

**An overview of the current technology infrastructure at AIISH**

The All India Institute of Speech and Hearing, Mysuru is an autonomous organization under the Ministry of Health and Family Welfare, Govt. of India established in the year 1965. The Institute offers both long-term and short-term education programmes in the area of communication disorders. The long-term programmes range from diploma to post-doctoral programmes. Of these, the Diploma in Hearing, Language and Speech is offered in 8 centres across the country through video-conferencing from the Institute headquarters. The All India Institute of Speech and Hearing has always been an early adopter of new information and learning technologies and services.

Botswana has incorporated ICT into its daily operations, in administration as well as in teaching and learning…Since then, the institution has vigorously pursued the policy of increasing the technological base in order to provide state of the art infrastructure to its clientele (UB IT Policy) [6]. UB has about 3,300 computers connected to the UB network; 1,700 of these are used by students while 1,600 are used by staff members (Batane & Motshegwe) [7]. In addition, UB has a Wide Area Network (WAN), Wi-Fi network accessibility on campus, Blackboard and Moodle Learning Management Systems (LMSs) for online courses, an Integrated Tertiary Software (ITS) for management of students’ records (Batane & Motshegwe) [8]. Recently, the ITS system was replaced with ASAS (Academic Student Administration System) for more efficient management of staff and student records. In addition, all lecture rooms and theatres are equipped with computers, multimedia projectors and screens to facilitate. lecture presentations. Certainly, this is a huge investment in education by a university in the developing world and it would only be rational for these resources to be effectively utilized and managed by all stakeholders.

In teaching and learning, UB has adopted the blended approach to classroom instruction. Tinio [9] explains that the blended approach refers to “learning models that combine traditional classroom practice with e-learning solutions.

ICT is not intended to substitute for the teacher but to be used as an enrichment of instruction.

At UB, all first year undergraduates take an ICT course which exposes them to the use of computers in learning and to the LMS platformsMoodle and Blackboard. In addition, the IT department organizes regular training sessions through orientation workshops and offers regular support to students throughout the academic year (Batane & Motshegwe)[24]

There are also several points at which students can access computers and internet facilities on campus. For example, every faculty has a well-equipped computer laboratory and IT personnel, the university library houses many computers with internet connectivity, there is also the IT building which has several computer laboratories for teaching, seminars, workshops and conferences. Indeed, the University of Botswana has provided ICT facilities and infrastructure for teaching and learning which are comparable to any modern learning environment in Africa and the world

The Institute has 100 Mbps dedicated leased line internet  with both wired and wireless connectivity. More than 300 computers have been deployed for the faculty and students in different settings including classrooms and laboratories for learning and teaching activities. There are 22 smart classrooms will full-fledged ICT infrastructure for computer-based learning activities. These include computers, digital projectors and lecture capturing system. The **Video conferencing system**, for conducting distant classes for DHLS programme in 8 centres across the country was established in 2008 and the connectivity was provided by the Bharath Sanchar Nigam Limited (BSNL). The Institute has a state-of-the art computer centre with 50 All-in-One computers of latest configuration and digital classroom technologies.

The faculty, staff and students are provided with the facility to access the subscribed electronic information resources remotely using user-name and password.

Since its establishment in 1965, AIISH has grown from two academic programmes to today’s array of master’s and bachelor’s degrees and certificates in areas such as ……, Of the 400 full-time students …. The teaching staff of 50 includes …. and …. faculty on contract.

However, e-learning activities in the Institute are still at an infancy stage. An informal preliminary investigation revealed that our e-learning activities are limited to the use of freely available e-learning tools such as google open education tools, Moodle Cloud and the instructional support tools available with Turnitin, the antiplagiarism tool that the Institute subscribes. Faculty members are not using e-learning tools or platforms to their maximum potential and delivering an entire course content online. On the other hand, a number of prominent educational institutes in the country and abroad are putting up their courses on the web and helping the students to harness the benefits of e-learning technologies. Also, our faculty profile system needs to be upgraded from the static pages with publication details displayed on the Institute website to a dynamic, integrated and interactive system like hundreds of institutions across the world who are making use of dynamic open source tools for showcasing their faculty profile and scholarly activities.

In the academic years of 2014 and 2015, we introduced Projectors with an electronic blackboard system

into about three-fifths of all the classrooms through bids at the expense of the AP budget. Furthermore, the

wireless LAN device was set up for use in all of the 25 classrooms in all five grades (from the first to the fifth

grade) of all the five departments, so that the introduced LMS systems, such as Moodle and Blackboard, can

be used in class. STORM Maker, software for making teaching materials, was introduced to make teaching

materials for storing in LMS. The special characteristic of STORM Maker, which has an automatic voice

synthesis function, simplifies the process of making content based on materials. Therefore, we can easily

create teaching materials with voice for e-Learning with the work of entering character, without recording

narration voice. Both male and female voices can be synthesized, depending on use and characteristics of

teaching materials. Moreover, we introduced more than 160 Tablet computers (Toshiba), 50 notebook PC

(Fujitsu) and 20 surface (Microsoft). All of them were introduced for lending and set up for connecting to all

the access points of the wireless LAN for e-Learning in class.

The introduction of the electronic blackboard makes it possible to draw and write on its surface with a

dedicated electronic pen, without connecting to a personal computer, and digital data of drawing and writing

can be recorded and stored in a file server connected to the network. Using the projector control toolbar

displayed on the projection screen of the electronic blackboard, teachers can easily select and control

students' tablet screen by operating on the screen. (Figure

To adopt e-learning, schools should attain

some level of physical infrastructure development while e-learning users should have necessary

technical competency blended with positive attitudes and perceptions towards e-learning

Current and emerging technologies enable Open Distance Learning (ODL) institutions integrate e-Learning in innovative ways and add value to the existing teaching-learning and assessment processes.

CMCSS has 31 schools serving more than 28,000 students and 1,800 classroom teachers.

The necessary technology Infrastructure which includes; high- speed access to networks and the Web, provision of appropriate classroom technologies, and student computing abilities is now being provided by some institutions in Uganda (Kahiigi, 2013).

**Blended Learning**

**Detailed analysis of results**

The results of the research were two dimensional – development of products in the form of online platform for e-learning, online faculty profile system and training manual for e-learning, as well as pilot trials of the impact of e-learning platform. The same have been presented herein under:

A. Product Development

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B. Outcomes of Field Trials

Pilot study was carried out with students from the disciplines of speech and hearing, and special education at the levels of post-graduation and under-graduation, respectively.

The field trial of the former group involved trial demonstration of online classes on Moodle platform utilising facilities such as video conferencing over Big Blue Button application \*. The trial session involved 60 students taught by one faculty over a duration of one hour. The session was coordinated and observed by the Principal Investigator. Suggestions for further improvisations and troubleshooting were noted down.

The second field trial was detailed experiment involving 13 students of a bachelors course in special education taught in the first semester of the two-year programme. The students were taught in the conventional method during the first half of the course and over the Moodle platform in the concluding half of the course. Both the phases of instruction extended over a duration of eight-weeks each covering two units of content of core course of the B.Ed.Spl.Ed. (HI) programme. The instructional efficiency in terms of student performance in the two modes of instruction were compared. Students’ perceived satisfaction about the integrated learning management system were compiled.

To commence with the empirical data sets in the form of students’ performance scores were subjected to test for normality. As both the pre and post-intervention scores were found to be normally distributed, parametric statistical measures such as t-test for paired samples for measuring variances and Pearson product-moment correlation for determining correlation were made use of.

The first section of results pertains to quantitative, empirical data derived from comparative analysis of influence of Moodle Learning Platform on learning outcomes arrived at the following results:

i.  The academic performances evinced 12% advancement in the scores from the first stage of conventional instruction (77%) following facilitating learning with Moodle learning management (89%). Following subjection to statistical measure of t-test for paired samples, the advantage was also found to be statistically significant (t = 3.22; p < 0.001).

ii. The ongoing supplementation of learning through Moodle platform also seemed to sustain a credible and consistent learning pattern among the students with strong trends of correlation between formative and summative performances (r = 0.98; p < 0.001).

The second section of results presents qualitative insights into student-teacher disposition about Moodle learning experience:

From teacher’s perspective the Moodle platform was advantageous in –

a.  Making learning and reference materials available to students.

b.  Timely conduct of ongoing assessment with immediate feedback.

c.  Diversifying assignments according to varied ability level and interests of students.

d. Providing extended scope for application of learning outside classroom.

e. Conservation of active instructional time, while also facilitating supplementary time for learning outside bounds of class.

Students exhibited a mixed perspective as gathered from their responses to the questionnaire –

a.  In the context of instructional transaction, the major advantage (89%) was the access to comprehensive learning material and individualised learning exposure enabled with the aid of Moodle platform.

b. However moderate affirmation (50%) of the interest created and increase in workload indicates need for further exploration of diverse prospects multimedia forays that effectively engage the learner without taxing them.

c. Students’ satisfaction on evaluation is also not optimal with only 58% assent for prompt and confidential assessment. The reasons being spelt out that assessment accessed out of bounds of classroom permitted misconduct on part of students. Future measures have to be directed to make assessment processes fool and tamper-proof.

d. Students were appreciative (79%) of the student-centred features facilitating anytime anywhere learning as well as the possibility for making up for missed classes.

e. They also highly commended (94%) the extended access to additional information resources and variety of teaching-learning material.

f. This pilot trial did not seem to stimulate sufficient interaction with teacher and among students outside the classroom bounds as implied by the lukewarm responses (38%).

g. Deficient technical expertise in students or under provided technological facilities were not deterrents in this experiments with Moodle as 83% of the students were satisfactorily provided with both.

h.  Considerable numbers of students (58%) opined that Moodle could best supplement conventional classroom instruction rather than substitute, especially because of its impersonal nature.

i.  Through their descriptive remarks students had recommended for fool-proofing assessment exercises, include more active assignments in the form of projects, and provision of printed handouts for students who do not have 24X7 access to ICT facilities.

**Conclusions and scope for future work**

Abiding to the objectives the project work was successful in setting up a versatile online learning platform primarily making use of Moodle open source software along with other add-on applications such as Big Blue Button \*. The platform could sustain around 45 courses at diploma, under-graduate and post-graduate levels. The field trials drew out the viability of the platform for comprehensive instruction and evaluation. They also provided suggestions for making it more robust. The only limitation in realising the objectives was that training of faculty and orientation of students to commence regular implementation of the platform could not be carried out. This was due to inevitable technical issues pertaining to e-security set-up in the institute. However, the same resolved and the training shall be completed before the end of academic year 2020-21

1. **Implications of the Study**

The present project is expected to have the following implications:

1. The E-learning system will improve collaborative learning in the Institute
2. It will also facilitate flexibility in learning and teaching activities
3. The Faculty Profile System will enhance the accessibility of faculty research output to a global audience.
4. **Utilization of the Study**

Both the e-learning platform and faculty profile system will be deployed in the Institute after getting the necessary approval from the competent authority.

**References**

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