A DIGITAL EDUCATION INITIATIVE IN AGRICULTURE

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Abstract

With the development in Agricultural Science and technology, the need for improved agricultural education throughout the world has been realized. Quality Education in Agriculture is a service that contributes to national development, integration and regional cohesion. With the development in ICT, eLearning has become the part and parcel of education programmes in all sectors of life. Agriculture sector is also not far behind with the inculcation of digital mode of teaching and learning with the conventional teaching mode. In this direction, an eLearning platform "eLearnAgriculture" has been designed and developed for the post graduate courses in Agriculture Sciences (http://elearnagri.iasri.res.in/home). The system has been developed in way that the teaching, learning, evaluation and administration of the courses and users can be accomplished online. Presently it has been enriched with the fundamental courses under the disciplines of Agricultural Statistics and Computer Applications. The system has the capability to provide teaching and training material in the form of text, graphics, audio and animation. The digital mode provides an opportunity to the agricultural educationists to create and link their course content in a real time format using the multimedia tools which may not be available or accessible with conventional teaching methods. The students also get a chance to study and learn the multimedia enabled digital course content at anytime, anywhere. The standardized format adopted for the digital course content creation on the site has been discussed in this paper along with the technology developed and adopted for the course content creation. The course content has been designed and developed using a standardized format.

Key words :

Introduction

eLearning is the use of Information and Communication technology to enable people to learn anytime and anywhere. Primarily the traditional methods of learning have been in use in the education. But research has shown that Electronic communication, Information Imaging technologies offer methods for delivery of education, training and learning much more convenient than traditional methods. (Fritz et al. 2002; Murphy & Terry 1998). With the advances in internet technology, web based eLearning systems are gaining popularity. Being online, these systems provide an opportunity to learn any course/subject from any part of the world at anytime.

It may be helpful in resource saving in terms of time, money, paper, etc. that will improve the accessibility to the course instructors as well as students. In consideration with the changing trends in ICT and scarcity of time, the role of eLearning has increased. Once the course contents are digitized using some Content Management System (CMS) and the same are made available on the web, they can be effectively used by the researchers, instructors and students. eLearning supports increased communications between teacher and students, and among students. It encourages students to take responsibility for their own learning and creating an environment that promotes an active approach to learning. Students

can take quizzes or read the course material during their free time. It is a boon to the working students and professionals who need flexible access to courses, and an eLearning system is a powerful way to give them what they need. The services and format of eLearning allow many additional benefits, like the audio - video presentations makes learning more interesting. An eLearning course has a global student audience. The format allows students to learn easily for the standardized tests by

downloading the study material they want. It also allows the students to improve their scores in the standardized tests, by taking as many tests as they want. The eLearning format allows students to speed up and slow down as they deem necessary. There is more flexibility in terms of time limit or age barrier. eLearning opens up a new world of studying comfortably and with better results. Technology advances and especially web-based training also provide new opportunities for teachers professional development (Grey et. al. 2004).

2. Content Standardization and Creation

Content standardization and creation are two main components of an eLearning system. The course teachers remain involved in this activity during the whole stages of course building and implementation. But before actually starting the course creation, the course content has to be standardized for common modules, common standardized text format and common look and feel of the courses.

The first step towards standardization is designing of a common course framework which includes:

- Design of a uniform structure for the course content.

- Collection and Digitization of Course Material (Syllabus based).

- Detailed digitized course content creation using Moodle: Chapters, Solved examples, Quiz, Assignments, Glossary and presentations.

- Creation of Multimedia enabled Content: Audio recording with lessons, animation Creation in presentations.

2.1 Design of a uniform course structure

A course is subdivided into various lessons based on the main topics underlined in the syllabus. Each lesson had the common structure and format within a course. At the end of each page in the lesson there is a review question; based on the answer of the question the subsequent path in the lesson may be linear or non-linear. With each lesson there is a Goal, the detailed Lesson Content, Quiz, Glossary, Audible Power Point Presentation and the summary. This structure remains the same for all lessons in all courses.

2.2 Course Material Collection and digitization

The course material is collected for each lesson on all common entities depicted under the uniform course structure. The content of each page of a lesson is collected and digitized as per the standardized format Preparing the text material, tables and graphics, Questions, Glossary, Quiz, Assignments and Audio Scripts.

2.3 Creation of the course content

Content development encompasses authoring, maintaining and storing the learning content (Ellis. *et.al.2009*). The

Learning Management System (LMS), MOODLE (Modular Object-Oriented Dynamic Learning Environment), has been used for the creation, management and deployment of the eLearning system. It is a free and open-source eLearning software platform. It has features that allow it to scale to very large deployments and hundreds of thousands of students. The course content has been finally created using the tools available under the MOODLE editor.

2.4 Common Template for eLessons

The system presently contains some basic courses under the disciplines of Agricultural Statistics and Computer Applications. The course material has been designed and developed by the course instructors actually teaching these courses. The courses are offered online, so the students have the flexibility to enroll themselves in the courses of their choice, can study and evaluate themselves at their preferable time. Each course has been divided and arranged into several lessons. Each lesson has the common format for text, figures and presentations etc. Also a common representation scheme/ Template has been followed for all the eLessons under a course. This template includes the following:

- **Goals and Summary**

The goals of each topic have been given in a precise language so that the learners of a particular course can get to know the purpose behind the topic and a general insight into the content they will be going to learn under that topic. The summary of each topic gives a summarized view of the topic. All the content that has been included in the lesson content is depicted briefly in the summary.

- **Interactive Lesson**

The lesson content under a topic is divided into various pages and the Text, Tables, Equations and Images to be included in that page were identified. Some real life solved examples have been added in most of the lesson pages. These solved examples enhance the clarity and practical usability of the content. It was also tried to add a test question after each lesson page so that the user is tested for the content he read in that page. A feedback is provided for each answer that the user selects. If the answer was correct then only he can move on to the next page in sequence, otherwise he has to attempt it again. The equations were added using the Dragmath equation editor integrated with MOODLE.

- **Glossary**

A glossary has been developed for each topic of the course. It contains the definitions of all important keywords used in the lessons. The keywords have been alphabetically arranged in the form of a dictionary. The glossary has the auto-link feature through which the keywords get auto-linked to their definitions wherever they appear in the courses.

- **Audible presentation**

Each topic has been enriched with multimedia enabled presentations. The presentations depict the whole lesson content in a brief and interactive way. With some presentations audio has been recorded in the voice of the teacher and uploaded in the system as SCORM (Sharable Content Object Reference Model). These presentations are very beneficial to the students in understanding the concepts very easily through graphics, animation and voice embedded with these presentations.

- **Quiz**

A quiz containing a series of questions was created for each topic. The type of questions that have been included in the quiz were-

- Multiple choice
- True False
- Matching choice questions
- Short answer questions.

The student can retake the quiz after submission.

- **Grading**

The students are evaluated and graded on the basis of grade system chosen by the teacher. For each correct answer in the Quiz, the teacher can give appropriate grades in the range of -1 to +1 along with a feedback. After submission of the Quiz by the student, an overall percentage grade is provided by the system. Based on the grading and feedback the student can opt to retake the quiz and perform better.

- **News Forum**

In every course of the system, a forum has been created for general announcements and distribution of assignments by the teacher. The students can discuss any topic with other students and teachers through this forum. Every subscribed user of the forum are sent email copies of every post in that forum. The teacher can force the subscription on all the students so that everyone in the class will get email copies.

3. eLearnAgriculture Users

eLearnAgriculture has three user types: The Student, The Teacher and The Administrator. The users have different permissions and different activities to do in the system.

Administrator
Manage discipline information
Create/view teacher
Assign courses to teacher
View course material
Student
Teacher
Create/view student
Add/Edit course material
Manage teacher/student information

3.1 The Student: Students are restricted to make any kind of changes as they only get permission to view and reply in all the courses, Quiz's, assignments and Forums of their category. They can submit their assignments or can write on the forums as an editor window is available to them where they can fire their queries and can reply. On eLearnAgriculture, student role is the default role for the users of this site. For that, they have to register themselveson the site by filling up the Registration Form available under the Register tab on the home page of the site.

3.2 The Teacher: Teachers can view, add and edit all the contents of their subjects. The teachers are the content creators of their courses. They collect the course material as mentioned in the course syllabus and divide the whole course content into various lessons/ topics. Then for each topic they have to prepare the Goals, Glossary, Lesson Content, Quiz, power point presentations and Summary.They can set the marking strategy for the Quiz questions. They are allowed to

post in forums and give assignments as per their course. They can generate the reports of students based on their performance. They have the privilege to view and edit the course content. Teacher is the overall creator and manager of his course.

3.3 Administrator: Administrator provides all types of authentications, restrictions and permissions. Administrator has the right to delete any user or restrict any user privileges. An administrator can change relationships as he/she is the person who provides right teacher under right course. He/she manages backup of all the users work, performances and system back up files as he can also maintain login sessions, he can generate reports as a whole and as per specified user according to their performance. So whole system is governed and managed by the administrator. The activities performed by the three types of users of this system.

DISCUSSION

The system eLearnAgriculture has been developed to provide an online eLearning platform to the students and teachers of agriculture education. The students can access the course material at their preferable time and can complete their assignments whenever and where ever they are. They are also free to discuss their view point and problems within the user groups and the teachers as well. They can also collaborate for the betterment of the course content. The eLearning system will support increased communications between staff and students, and amongst students. It will provide frequent and timely individual feedback through computer assisted assessment. It will support economic reuse of high quality expensive resources and encourage students to take responsibility for their own learning by creating an environment that promotes an active approach to learning. The teachers can make the classes more effective and efficient by including multimedia content like graphics, charts, audio and video. It will also help in avoiding face-to-face interaction time. There is a wide scope of adding agriculture courses of other disciplines in eLearnAgriculture. Once the material of all courses will be created and implemented, it will be helpful to the people involved in teaching and learning agricultural education online and will act as a significant online resource.

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