AN INNOVATIVE APPROACH AND DESIGN ISSUES FOR NEW INTELLIGENT E-LEARNING SYSTEM

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ABSTRACT

The E-Learning is new trend in the current 21st century. All learners and the instructors are very depending on online e-materials available on Internet. But the major problem facing both the learners and Instructors are, which is best e-learning content delivery systems out of the number of available application tools? This paper presents the result of an experimental result of case studies of different e-learning applications used in the real life around the world wide. Commonly e-learning system consider as web base application, but now a days it is also available in different format like desktops application, mobile application etc. After reviewing and studying a various e-learning systems, different observations and also some of the recommendations are given for enhancing the future of effective e-learning systems. Intelligent e-learning approach is main focus of this study work.

KEYWORDS: *E-learning, Semantic Web, Software Agent, Moodle, peerwise.*

I. INTRODUCTION

In recent years new demand of the modern education aids are to make an availability of learning stuff in an electronic format, the term called as e-Learning. The e-Learning is basically a computer-based learning or a web-based learning, or by the use of mobile technologies, it includes virtual classrooms and digital collaboration and uses. But future of this trend will demand more than this static information displaying system. To accomplish this new demand of 21th century, researches now focusing on I-Learning that is stand for Intelligent Learning sources, which will be provided by the collaboration of the Intelligent Software Agents and the Semantic Web technology.

Since young teachers community is belonging from the NetGen or Google generation [1]. The use of this modern ICT in education requires new teaching methodology for focusing on collaboration on the part of the teachers and students. The teacher's role in virtual space and beyond is important, since he/she has to teach the students to make them creative and innovative [2].

The current manuscript is organized as: Various researchers views about online e-learning is describe in section II, The first case study on Moodle e-learning system is explain in section III, the second case study on Peerwise, an online questionnaire developed at Auckland University, New Zealand is demonstrated in section IV, observation found during the study is presented in section V, the suggested recommendation are in section VI, and finally authors are conclude the study in section VII.

II. RELATED WORK

Janis Kapenieks [1] had performed a new methodology for effective e-learning process, author used an Action research in an e-learning environment that helps the students not only to create new knowledge but also to change their views and interests in a way that enhances their creativity by enhancing their practical skills in problem solving and an analytic and reflective mind which in its stead enhances a person's intellectual potential.

H. Fletcher et. al. [3] proposed a conceptual framework using andragogy theory, especially based on the learner's need for self-directedness, and transformative learning theory. It supports the self-directed learner and the learning process.

Yasir Eltigani Ali Mustafa and Sami Mohamed Sharif [4] provide details about adaptive e-learning hypermedia approach. The proposed adaptation model in AEHS-LS specified the way in which the learners' knowledge and learning style modify the presentation of the content. For experimental purpose authors used the VARK questionnaire to determine the learning style of the participants.

But the limitation of this e-learning system is that it is totally depend on a human interaction such that to upload the e-learning resources like Audio version , Text Version ,Visual version.

M. Grigoriadou et. al.[5] performed an empirical study to evaluate the adaptation framework and assess learners' attitudes towards the proposed instructional design. The number of students involved in the experiment was 23, which is still relatively small. They used descriptive statistics analysis in the form of bar and line charts.

Abdallah Gomah had find out that the majority of current web-based learning systems are closed learning environments, where courses and materials are fixed and the only dynamic aspect is the organization of the material that can be adapted to allow a relatively individualized learning environment. Author has suggest a Web recommender systems are important to facilitate web usage and decrease time and effort needed to reach information needed by a user from this huge number of web pages that seem similar[6].

The authors had focus on various issues that are normally ignored by any e-learning resource systems. They had found out that while designing a good online examination system, some of the well-known problems related to systems are: Lack of well-structured online examination system, Incompatible question type and non-availability of question editor, Question upload and format related issues, Difficulty in question contribution, slow response of examination system, Question Bank ageing and finally Security of assessment platform [7].

Even though E-learning has grown and is expanding at a very rapid pace and the benefits it offers increase the number of e-learning users. Its functionality continues to expand and relies more and more heavily on the Internet. But it has been face lots of technological issues, such as preparing efficient infrastructure. Bandwidth and connectivity issues, learning material is also an issue, since a lack of quality content is prepared.

Some of the basic challenges in e-learning systems are it must be used a multimedia instruction, autonomous learning, instructor-led interaction, improvement of learning effectiveness, social presence confidentiality, availability , integrity and security that are all also consider while design it[8].

Authors had discovered an innovative approach for enhancing e-learning system by introducing hinting e-learning system. After making a comparison between a computer and human teachers generated hints, they are concluded that not an e-learning system is not better than the teachers nor that the teachers are better than the e-learning system. However, they do suggest that human teachers can be replaced by the hinting e-learning system without a significant loss of effectiveness, because the difference between the hinting tutor and human teachers would be in the interval [-0.38, 0.70] with a 95% probability [9].

The Intelligent learning through a web services architecture helps in distributed, service oriented e-learning system. Author has find out the major problem in e-learning system that information is present in distributed format on the Internet, but with the help of agent platform and web service based LCMS system , it provide a assistance to a learner [10] .E.Kovatcheva, R.Nikolov had find out the new approach of e-learning system i.e. Adaptive feedback approach. This model is based on Computer Adaptive Test Theory (CAT) and organization of the learning domains. They used the learning objects (LO) and the test item ontology as resource structuring. It supports flexible adaptive

strategies for assessment and navigation through the content. The propose system supports adaptive feedback to the students depending on the learner evaluation [11].

III. CASE STUDY-I

To find out limitations of e-learning system, study is performed on two different e-learning systems. The first one is worldwide used LMS i.e. moodle. In Moodle, first Instructor needs to login in e-learning system by simply providing user name and password as shown in Figure 1.

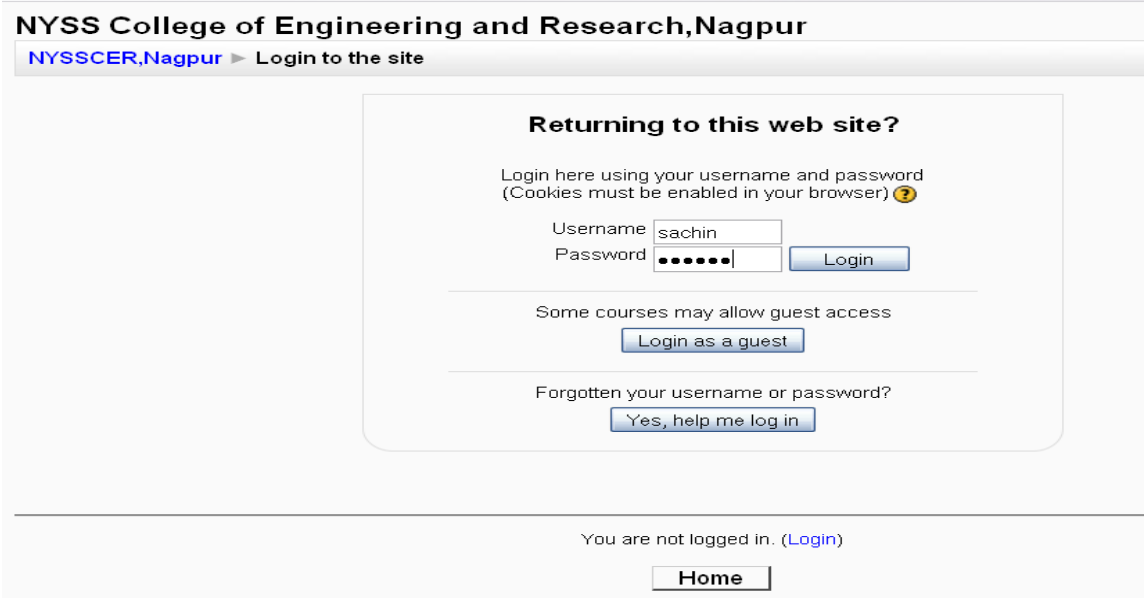

Figure 1. Moodle Login Screen

Now, in the next step an instructor will add a various study materials of subject for learners as shown in Figure. 2.

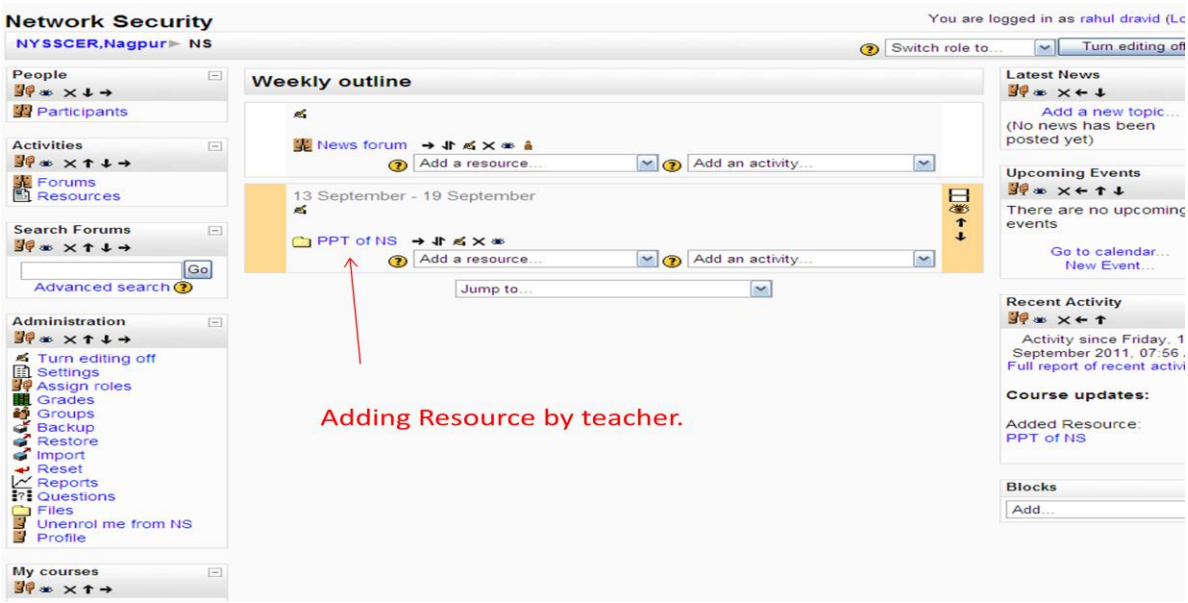

Figure 2. Adding study materials by Instructor

After login by learner they will views different e-resource uploaded by Instructors as shown in Figure 3.

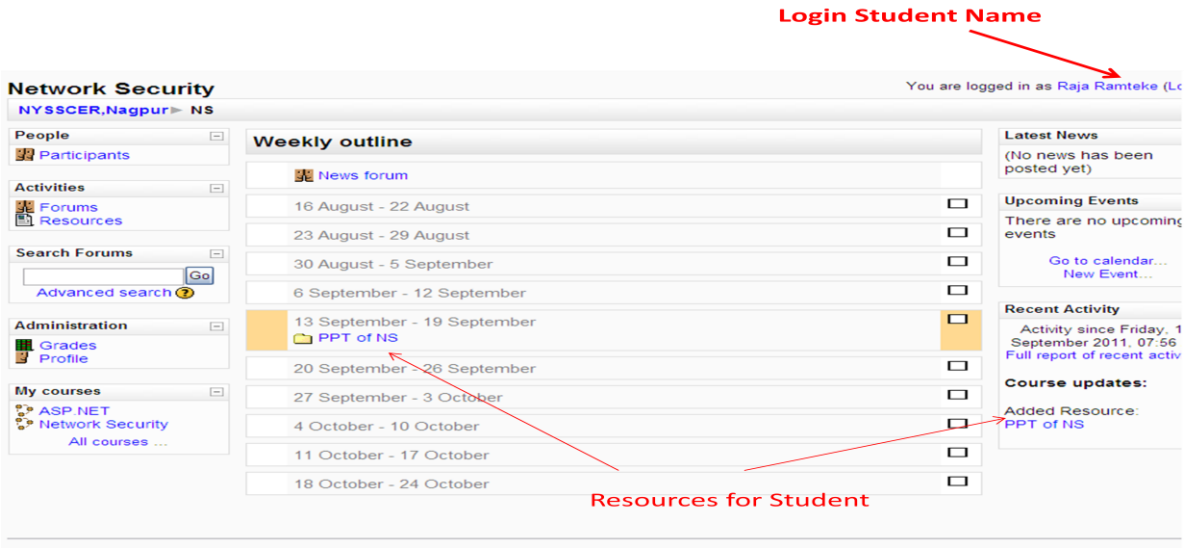

Figure 3. Learner's e-Resources

Learners may simply download these e-Materials and use it for study as shown in Figure 4.

Figure 4. Learner Downloads the e-Materials

IV. CASE STUDY-II

In the second case study an e-learning application of the Online Questionnaire PeerWise is studied which is developed and used at Department of Computer Science, The University of Auckland New Zealand. It provides the statistics of responses given by the students to different queries and also the graphical presentation of trend of student responses to the questions.

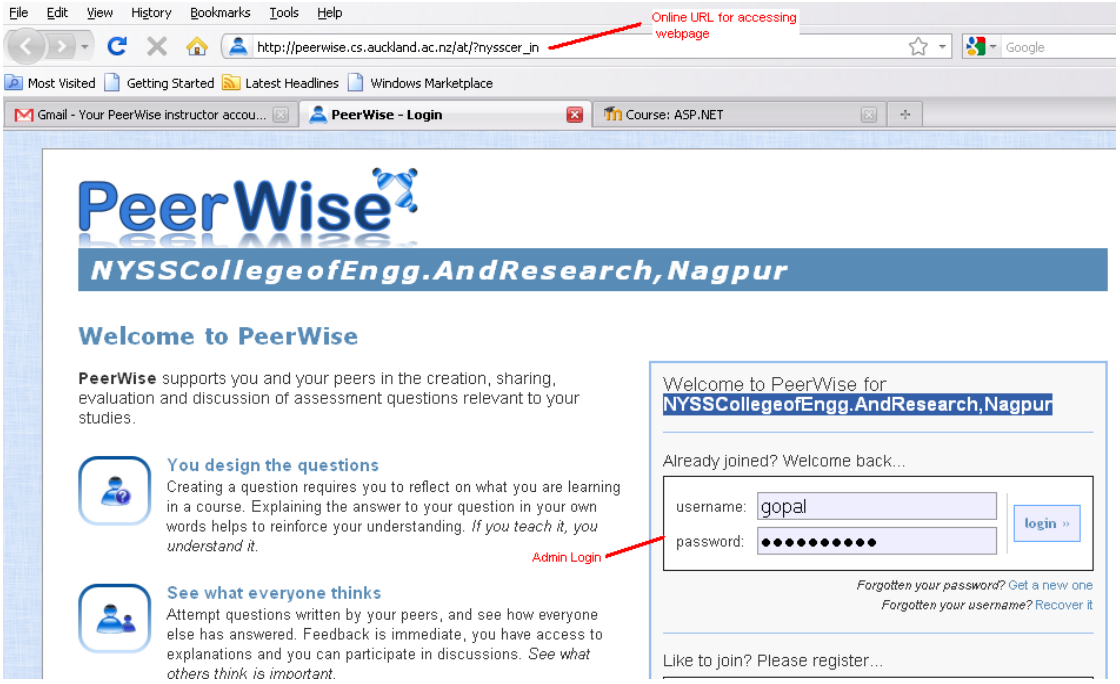

Figure 5. Peerwise Login for Instructor

The instructor needed to login to the system as shown in Figure 5 and can upload number of questions test for students as shown in Figure 6. Then students will after successfully login to the system can attempt to solve the question give in the test and recorded their response and result online as per shown in Figure 7.

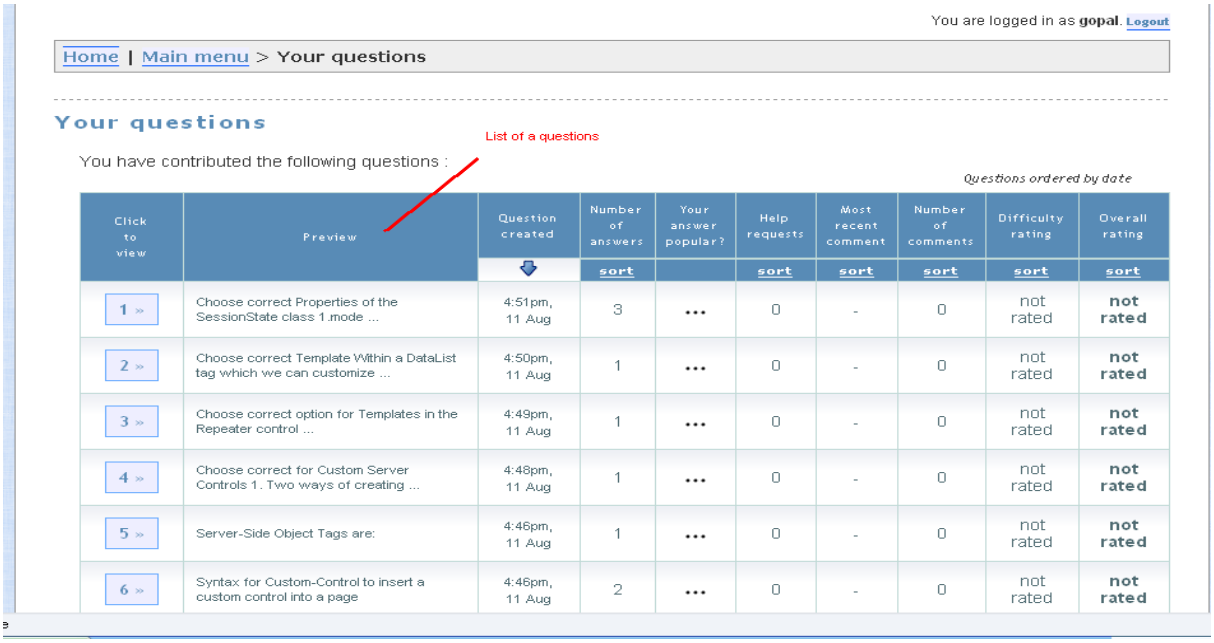

Figure 6. List of questions with respective answer

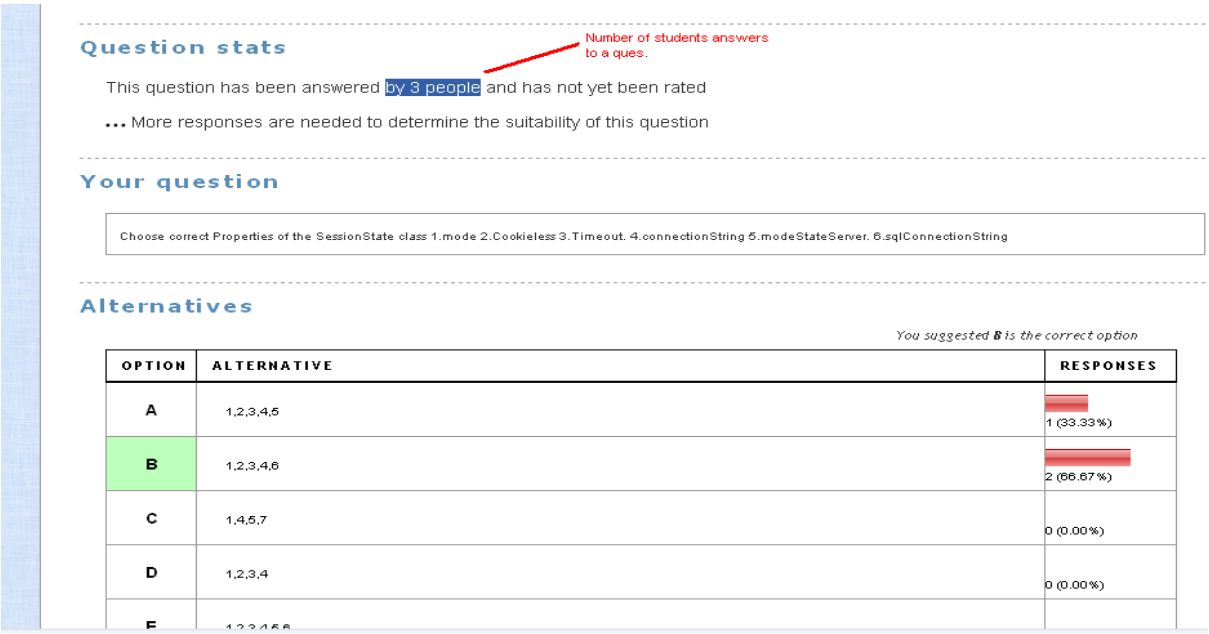

Figure.7 Response percentage to question

V. OBSERVATIONS

After reviewing study of number of e-learning systems and actual study of the above mention two systems , we found following few limitations and drawbacks in e-Learning resource provided by various LMS and they are as given below

- They have lack of flexibility.
- Less attention to learning style and its effects on learning.
- They are centralized and offer courses within fixed contents format.
- Do not provide personalization and intelligent help.
- Does not use data gathered from the students during the e-Learning process for further improvement.
- In both synchronous and asynchronous e-learning system, maximum use of human interaction is required.
- Human teacher may have limitation of knowing students subject knowledge , attitude toward learning, students state of mind , also not reliable tools available for know these above mention parameter.
- Human teacher can't be properly analyses students according to their basic knowledge.
- Human teacher may have limited information about diverse e-resources available on internet.

In these present e-learning systems, the content delivery is not automatic and in intelligent ways.

VI. RECOMMENDATIONS

- E-learning system should provide visual demonstration of topics.
- It should have statistical analysis before using of that particular online topic and also provide some opinions about topic.
- It should have ability to collaborate and innovate new topic information.
- It should use Artificial Intelligent with voice recognition to interact with user.
- It should have a learning ability.
- It should provide answers come from internal database, Web, Wiki, previous conversation.
- It should search information from several online databases, like Google, Ask.com, Bing and others.

VII. CONCLUSIONS

The boom of e-learning system is continuously increasing because of various international universities allow, a distant education all over the world. Which provide guaranteed flood of information to students which gives a holistic learning experience.

The main limitations of these e-learning systems are they are static, not personalize and not provide an intelligent help to learners. There is high need to design and develop versatile, flexible and intelligent e-learning system in the distance learning environment and in LMS to achieve objective of teaching and learning process.

The next upcoming challenges in developing effective e-learning systems, it may be online or offline is that it should be intelligent and user oriented .The user oriented means that it will provide the e-materials as per the user's current requirement and level of knowledge. We intend that for the web base e-learning system, combination of emerging Semantic Web based technology and Intelligent Agent will be assist to achieve this herculean task.

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Also authors would like to thanks, the PeerWise web site *http://peerwise.cs.auckland.ac.nz/at/?nysscer_in* application appears in this case study is which use as a non commercial purpose.

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