E-learning of programming languages based on cloud computing

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ABSTRACT- Nowadays, E-learning is an internet based learning process. The proposed work uses internet technology to design, implement, manage, support and extend learning and will greatly improve the efficiency of learning several programming languages. It includes various tutorials, practice questions and several online tests on programming concepts. The current software for E-learning lack the support of underlying infrastructure, which dynamically allocates the required computations and storage capacities for E-learning. Regular updation of programming contents is also missing in the current E-learning software's. With the implementation of E-learning by cloud computing, server system failure occurring at traditional model of internal server can be prevented thereby enabling users to get connected to the network via internet. Users can access it through PC, mobile phones etc. Hence, E-learning is made simpler. Students can take exam online; receive feedbacks, post assignments online. Teachers can prepare online test, interaction and better resources for students through content management, feedback and communication with the students through forum online. Thus, E-learning of programming languages by cloud computing is more efficient and helps students acquiring better programming skills.

I. INTRODUCTION

E-learning exploits interactive technologies and communication systems to improve the learning experience. It has the potential to transform the way we teach and learn across the board. It can raise standards, and widen participation in lifelong learning. It cannot replace teachers and lecturers, but alongside existing methods it can enhance the quality and reach of their teaching, and reduce the time spent on administration. It can enable every learner to achieve his or her potential, and help to build an educational workforce empowered to change. It makes possible a truly ambitious education system for a future learning society.

The growth of mobile device and tablet PC makes E-learning to wide spread. The student vcan learn and assess himself from anywhere using these devices. The different device platform and screen size enforces the E-learning system to have more interoperability, scalability and flexibility in order to operate on the various systems. Unfortunately, some problems of E-learning cannot be solved by the previous studies. Thus, cloud computing is the suitable solution[1].

Cloud computing is a type of computing that relies on sharing computing resources rather than having local servers. The five characteristics that defines cloud computing are on demand self-service, ubiquitous network access, resource pooling, rapid elasticity and measured service. Cloud computing is device-independent because cloud computing resources can be accessed not only just from any computer on the Internet, but also from any type of computer. Provided that, it has an Internet connection and a web browser, it really does not matter, if the computer being used is a traditional desktop or laptop PC, or a tablet, smartphone or smart TV[2].

E-learning of various Computer Programming Languages consists of information about the different programming languages. It is an information system with additional features. The user can take quizzes, choose difficulty levels and input their names for ranking purposes once the scores are tallied. The faculties can also monitor the student performance as the marks scored in the test are periodically displayed to them[3].

II. TRADITIONAL E-LEARNING PROCESS

As E-learning has evolved into a global change agent in higher education, it has become more diverse in its form and applications. Most of them are developed with

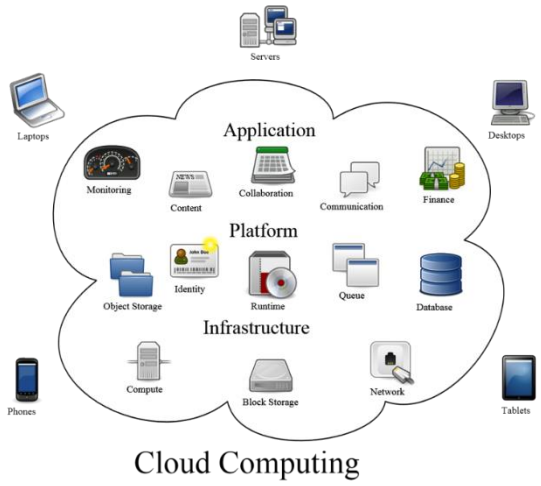

Fig1. Cloud Computing

normal server networks [6]. But normal server networks face large drawbacks like cost, administration, server failure, heavy traffic through which usage is difficult. Though E-learning improved a lot it, have some drawbacks in some parts. They are discussed below.

Only in a small group a person can develop properly. At school, students learn how to make friends, be patient, get rid of disappointment, and especially to compete. Competition between colleagues can be very stimulating and students will only benefit from it. The existing E-learning cannot offer human interaction. As there is no interaction between humans, one has less chance to gain knowledge through E-learning [4].

The next main disadvantage of E-learning is to be most cared. There is no interaction or communication between the faculties and the students for clearing their doubts. Not even the best online course can fully replace the personal contact with a teacher, or the human relationships that develop in a group. So, traditional classes shouldn't be replaced with E-learning[5].

Another disadvantage refers to the fact that online courses cannot cope with thousands of students that try to join discussions[8]. Moreover, they are not provided with video tutorials for better understanding as certain E-learning contents are difficult to understand.

Another major disadvantage in most of the E-learning websites is that, they are not providing a test at all[9]. In some cases, they offer online exams but not as level-wise (such as easy, medium ,hard). Due to the lack of level-wise test patterns, the users can't self-access themselves.

III. PROPOSED SYSTEM

Nowadays, E-learning through cloud computing is much popular when compared to E-learning through client-server. Most of them have been switched to cloud computing because they are cheaper in terms of cost and administration becomes easier thus reducing traffic and network failure is much reduced[10].

The E-learning should provide a way for the users to compete with this competitive world. So we must have to create human-human interaction or competition between them will give them more interest to study the contents much better than before. Competition among colleges through E-learning will also encourage the students to read well and compete with each other.

The next main aim of E-learning must is to improve bridge-gap between student and faculty. Thus, one can ask questions or queries to their faculty and the doubts can be cleared in an effective way. Here one can get a correct reply for their corresponding queries and others can't reply any false answers to their questions. In this way, comment statements can be effectively improved. Here the traditional classes can be replaced with E-learning.

The users of E-learning websites can be of any type. He/she may be either a slow learner or may grasp the concepts quickly. If E-learning websites are provided with more number of video tutorials, it will make even the slow learners to read and understand the concepts. Because watching a video about a particular concept is much more effective than reading. Thus understandability is increased through this.

E-learning has to conduct different modes of test to test user levels. It has to provide levels like easy, medium and hard so that brilliants can get opportunity to write test on hard concepts and also dull will get fire on their studies and try to write medium and hard concepts.

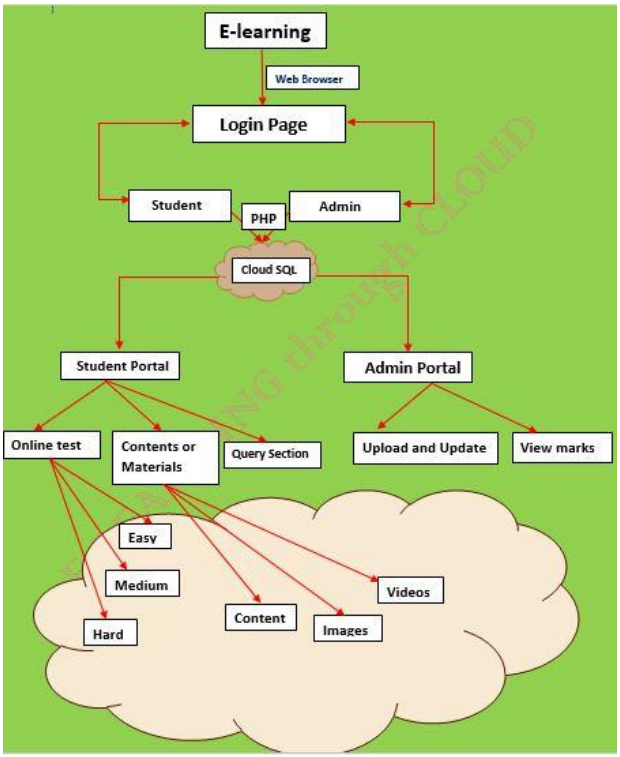

Fig2. E-Learning with Cloud

IV. RESULTS

The major findings of the factor analysis, factor dimensions are listed below:

Relevance of Course Contents:

- The courses are innovative and contemporary.
- Course contents/modules are relevant and updated.
- Audio-Visual Presentation makes learning effective.

Effectiveness of Delivery Mode Related Factor:

- The student never indulges in malpractices such as cheating etc.
- E-books, e-journals stimulate reading.
- Graphics, animations ignite learning.
- The instructor communicates ideas clearly.

Instructor Support and Students' Commitment Related Factor:

- The instructor is well prepared always.
- The student allots adequate time for his preparations/studies.
- The student does not hesitate to contact his instructor for clarifications.
- The student submits his quizzes, assignments on time.

Web-usage and Online interaction related factor:

- The student does not feel aloof in the learning process.
- The student gets adequate support for completing his/her courses.

Course Compliance and Confidence in the System Related Factor:

- The instructor is knowledgeable.
- The student is fully aware of the evaluation system and process.
- The students comply with the total course requirements.

Relevance of Testing Instruments and Grading Related Factor:

- Testing instruments assess the grasp and grip of the students.
- Instructor Grading is unbiased and transparent.
- The assessment tools are relevant and up-to-date.

Fig3. E-Learning Home page

Fig4. E-Learning Options-Menu

Fig5. E-Learning Quiz

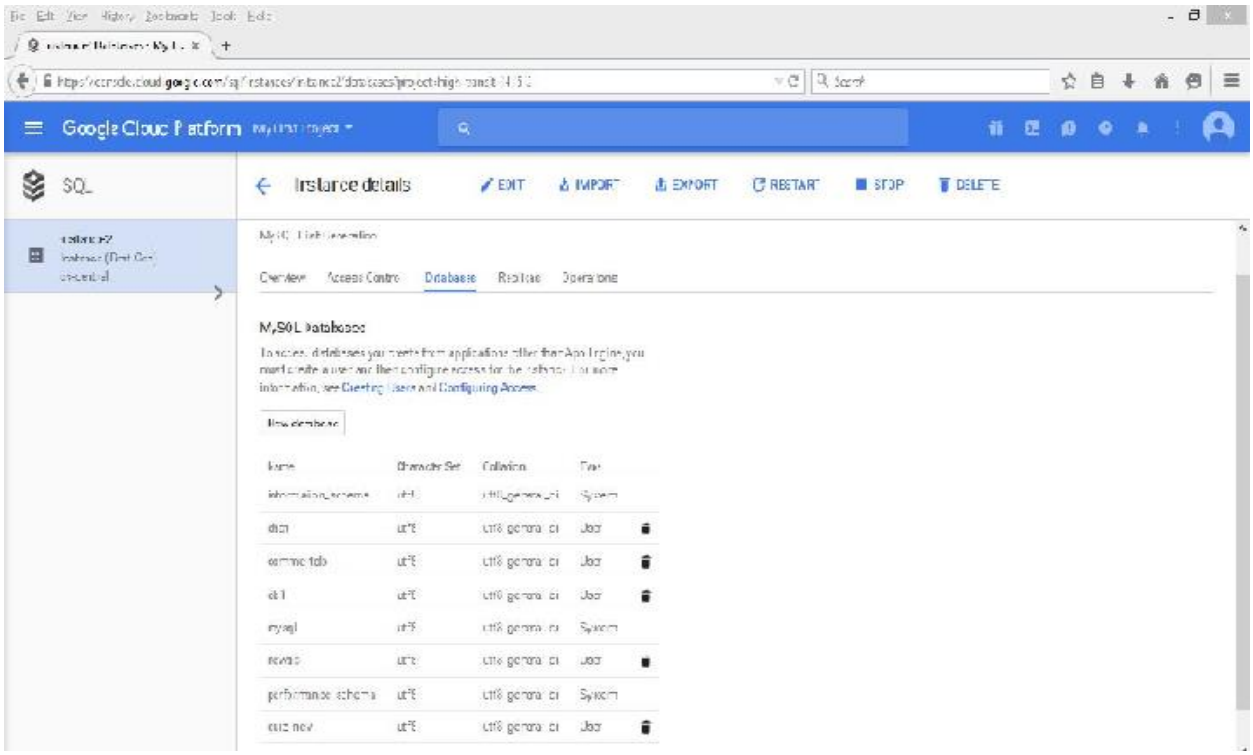

Fig6. E-learning with Google cloud

V. DISCUSSION AND INTERPRETATION

The First factor consisted of three items that were all related to the relevance of courses, course contents and the method of delivery. A cumulative score in the factor revealed that most of the E-learners agree that the course contents and method of delivery were relevant. This further demonstrates that few of the respondents were not happy with the existing contents and the method of delivery. This is an important finding to be reckoned with and also has implications for the universities offering online courses.

Factor two in other words, most of the respondents are of the opinion that the online courses are delivered effectively. This is again an important factor to be taken note of by the organizations/universities offering online courses. The universities should carefully consider the views/owes of the students who have stated that effectiveness of delivery needs to be improved.

In fact three, four statements aligned together. A close look at the four statements prompted the researcher to name this factor as “Institutional support and students’ commitment” related factor. This is indeed an interesting finding as the instructor and the cohorts support is quite essential for ensuring the success of the program. This factor reveals that both are co-operating very well thus ensuring the success of the online programs. Both the student and the instructor are on a balance mode where they work together for the further development and success of the program.

Though all the students are scattered at different places, the survey reveals that they do not feel aloof in the e-learning process. A look at all the items has guided the researcher to conclude that E-learners make the best use of the support extended by the online virtual universities. The various items clearly state that web-usage is at the desired level for ensuring the success of the program and the students are able to develop their skills sitting in one corner of their room.

Three items are aligned in this factor. A close look at the items guided the researcher to coin this factor as "course compliance and confidence" in the system related factor. It is a well-known fact that complying with the course requirements and confidence in the system are the essential pre-requisites for the successful completion of the courses. In this factor, the E-learners not only vouchsafe the knowledge level of the instructors but also repose a high level of confidence in the E-learning system.

With the students being fully aware of all the requirements and skills, the instructor too is pushed to the levels for teaching the students at their best.

The relevance of testing instruments is an essential pre-requisite for the success of the E-learning portals. So, a few questions related to the relevance of the testing instruments were included in the questionnaire. A total of three items have aligned in this last factor. In this factor, E-learners express their happiness with regard to the relevance of testing instruments and also grading. Though the Factor loadings are less, they show that a considerable portion of the E-learners are quite contented with the testing methods. The students are also being able to look upon the results of their tests. This enables the students to open their conscious and look where they stand in the competitive word.

VI CONCLUSION

Thus, through these research studies, we developed a E-learning website which offers several video tutorials of various programming languages, online exams with various levels and comment section for students. The queries posted by the students can be viewed by the faculty and replied appropriately. Hence, implementation of cloud computing in the e-learning process makes it more efficient.

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