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A FRAMEWORK TO CHECK THE EFFECTIVENESS OF ONLINE LEARNING

Dr. Manoj Kumar Srivastava*[1], Dr. Rajesh Kumar[1], Dr. Ashish Khare[1], Ms Jigyasa Kumar[2]

[1]Department of Electronics and Communication, University of Allahabad, Allahabad.

[2]Research Scholar, University of Allahabad.

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***Corresponding Author**
Dr. Manoj Kumar Srivastava
Department of Electronics and Communication, University of Allahabad, Allahabad.

ABSTRACT

The world is growing with pace of technology. People are technologically literate regarding social networking and using mobile technology as everyday tools, but they may still be beginners when it comes to understanding how to use them in purposeful and educationally oriented ways. Learning in an online environment may make peer and collaborative learning opportunities easier, thus supporting learner's cognitive, affective and social interactions. These ways of working also appear to suit many learners and lead to improve educational outcomes. As technology continuously influences learning, technical as well as organizational requirements need to be thoroughly investigated over a variety of learns. In this paper, an outline of those aspects is presented, which occurred from literature review on methods and research frameworks utilized toward the evaluation of online learning initiatives. The review identified a series of studies that take advantage of well-established theories in the area of users acceptance of technology along with the research findings. In addition, the effectiveness of National Program on Technology Enhanced Learning (NPTEL) towards the learning of students is highlighted.

KEYWORDS: Collaborative learning, educational outcomes, online learning, NPTEL.

INTRODUCTION

The online learning is a major aspect of today's education environment. It is an important aid of teaching learning process. There are various factors behind the success of online learning systems. Several researches have been done and results show the progress in different areas of learning is happened because of this approach. It improves class room teaching and student's acceptance and adaptability. The flexibility of learning and the availability of the course material are the added advantages of this system. The institutions of different sectors are developing a variety of personalized virtual learning environment that contain not only the course material of high standard but it has a very good delivery method. The virtual classes make a feel of normal classes to the students. They can submit their queries and accept assignment as well.

Learning effectiveness can also be improved by applying music composition software. The researchers proved that it is one of the better ways of learning. This software is developed to help the students to compose the rhythm and melody themselves.

Although most university classes use traditional face-to-face instruction, many online courses are available in which video lectures are used in many other form. The videos are simply created by uploading a video recording of a lecturer or recording a video lecture may be more complex, also can be paired with power-point presentations, quiz in many other forms and their demonstrations. Online video lectures have become increasingly common in recent years, as evidenced by their use in many organizations, educational institutions, and open learning systems, such as Course era, Khan Academy, and TED. Video lectures often provide students with additional time to fully understand classroom course materials by allowing them to review lectures repeatedly. Also, online video lectures with audio / visual instruction can enhance learning experience, allowing students to see and listen as they would be in an actual classroom.

As many educational institutions create and share video lectures, no conventional standard is available to create a video lecture. No guidelines are also available for the presentation style of video lectures. Importantly, the merits and limitations of each video lecture type for online learning have not yet been thoroughly investigated. In sum, despite a growing number and variety of online educational video lectures, their effectiveness in terms of learning and usability is poorly understood. Therefore, this study aims to explore how the three considered video lecture types including lecture capture, voice-over presentation, and picture-in-picture

affect the sustained attention, emotion, cognitive load, and learning performance of verbalizers and visualizers in an autonomous online learning scenario by using a two-factor experimental design. Results of this study significantly contribute to efforts to select the most appropriate video lecture type for online learning that maximizes learning performance in an autonomous learning context.

The purpose of music education is to generate musical experiences through various methods, making it as widely useful to the public and as richly cultivated for distinct individuals as possible. Author suggested that all children should have opportunities to learn music composition, enabling them to explore the world by using new methods and training their musical potential; moreover, additional musical experiences must be provided to supplement what they learn. They should be urged to display their music cognition and experience aural art to discover and shape themselves. Author indicated that music learning involves the ability to use one's comprehension, a process that is facilitated by teaching. Thus, one of the roles of composition in music education is serving as a teaching strategy that promotes musical thinking and understanding. Therefore, knowledge regarding music concepts and musical "know-how" must be integrated in music composition to enable composers to create pieces that express fragments of their musical understanding.

Author indicated that implementing algorithmic composition is based on the logic operation with music parameters being set according to the desired music style or emotion. The computer generative music can be integrated with other domains using proper mapping techniques. The note event transmission and music parameterization functions of the Musical Instrument Digital Interface (MIDI) can be used to minimize the number of intervention required when creators use computers to create music, resulting in the composition of various styles of digital music. In the elementary stage of learning, teachers can use automated composition software, which includes related programs, to supplement the learning of chord configuration and arrangement. Therefore, although students are unfamiliar with the concepts of these programs, they can still use this software to complement their inadequacies or to successfully create music, which is an aspect that induced the interest of researchers.

Gannon-Leary and Fontainha (2007) consider that the sense of connectedness, the shared passion and the deep of knowledge derived from ongoing interactions transform the knowledge development process into a continuous, cyclical and fluid one. According to their studies, the main benefit is the possibility to achieve the collaborative learning, which allows

us to obtain a synergy effect. Synergy means that two or more discrete learning agents acting together will create a learning result greater than that obtained by acting individual. This is based to the general systemic theory approach. This approach is about how a person's learning may be enhanced through the engagement with others. For achieving collaborative learning, incorporation of appropriate pedagogical models, such as team projects and/or case studies, peer reviews. From the technological point of view, group work spaces, discussion forums, email / white boards, chat services, online facilities for sharing documents in projects and case studies, online evaluation of projects and quizzes are some of the solutions adopted by the participants in order to develop and share knowledge.

Because of the popularization of electronic learning (e-learning), teaching curricula have been expanded from traditional oral lectures to include digital multimedia instructional materials (MIMs), which combine text, graphics, audio, and animation. This approach allows plain text to be presented in various ways that draw the attention of students to improve their learning outcomes.

However, employing diverse multimedia instructional materials (MIMs) does not necessarily correspond with a superior design of multimedia instructional materials. Mayer's (2001) concept of limited capacity in the multimedia learning cognitive theory is consistent with the study on cognitive load theory proposed by Chandler and Sweller (1991), which showed that an excess of complex words, pictures, and audiovisual effects could burden students. Furthermore, the inappropriate design and application of MIM can distract students and inhibit their learning outcome. Numerous scholars have studied the effect of MIMs on learning outcomes however, because their conclusions have been inconsistent, an effective combination of the various media that comprise MIMs remains a worthy topic for discussion. We demonstrate how various types of MIMs affect the learning responses and outcomes of students.

Common online learning media include lecture capture (or called the talking-head lecture), voice-over presentation, picture in-picture and Khan-style video lecture, all of which present multimedia information in different styles. A video lecture must harness learning motivation, increase learning performance, satisfy individual learning needs with different learning styles, and select the most appropriate format to facilitate learning. Also, cognitive psychology commonly views attention as facilitating the selection of incoming perceptual information and limiting the number of external stimuli processed by the bounded cognitive system to

avoid overloading. Importantly, a learning process without sustained attention lacks effective identification, learning, and memory. Restated, sustained attention to learning content is of priority concern for effective learning, explaining the need to determine whether different styles of video lectures affect sustained attention in online learning scenarios. Moreover, many studies have asserted that design of multimedia materials or video lectures should consider the affective state (i.e. a learner's emotional state). However, exactly how video lecture types affect learning performance, learner emotions, and sustained attention has seldom been studied empirically, results of which would provide a valuable reference for video lecture design.

Limited working memory is a defining aspect of the human cognitive architecture and, accordingly, all instructional designs should be analyzed from a cognitive load perspective. Educational research has also confirmed that considering individual learning styles is more important than instructing all learners with one style.

Individual differences in learning styles must be identified when learners process video lectures since they add to existing knowledge of processing preferences and predict personality variables accurately. Of all the cognitive styles related to multimedia learning, the visualizer verbalizer hypothesis is especially relevant to individual differences when using video lectures for online learning because they typically present information to learners using audio and video (containing slides, texts, and pictures simultaneously)

The online certification courses are also one of the examples of its popularity and success. Stark et al[1] developed two on line certificate programs; both were dissimilar in that one converted an existing, traditionally taught program while the other was a completely new development. The later program was found surprising result in comparison to traditional teaching.

The present paper analyzes the effectiveness of NPTEL. The NPTEL[2], National Program on Technology Enhanced Learning, is a government of India sponsored collaborative educational program. The program aims to enhance the quality of engineering education in India. The course videos are available in streaming mode and may also be downloaded for viewing offline.

LITERATURE SURVEY

The teaching-learning system can be improved through online learning. Wang[3] developed a model 'GPAM-WATA' to evaluate the effectiveness of online learning system. The model uses a sample class of 107 students. These students were divided into four categories: 26 students, 28 students, 26 students and 27 students in different groups. The evaluation is done two phases: pre-test and post-test. The first two groups were tested through traditional method while other two groups were tested through teaching using online aid. The pre-tests comprise of a set of questions on defined topic, already studied by that group of students, and check their answers. If the answer is wrong, the concept with animation is displayed. The result of post-test was done through online material and was significant. The post test gave an improvement over the student performance.

A Personalized Virtual Learning Environment (PVLE) is a model developed by Dongming. The model can be embedded with self learning. Dongming[4] formulated PVLE model and developed an online learning framework to check the effectiveness of this system. The PVLE was tested through an empirical field experiment that involved the university students in different groups. The testing parameters were self learning, examination and satisfaction. The findings suggested that personalized online learning facilities enhance online learning effectiveness in terms of examination and satisfaction.

The online learning is effective in every field of learning. Tseng[5] has experimented and checked the effectiveness of online learning for registered nursing students. The effectiveness is checked through problem based learning (PBL) and concept mapping (CM). The authors used two groups: experimental group and control group. Then, they performed a quasi experimental design. The experimental results were evaluated in three time schedules: before the course began (pre-test), at the end of the course (post-test), and six months after the end of the course (follow-up test). The PBL-CM increased students' critical-thinking skills and personal accountability for self-directed learning and it would enhance the skills of independent study, reasoning, group interaction and active participation. This study offered guidelines for new nurse-training programs and continuing nursing education in clinical practice.

The effects of resources available on online portal on students are very high. The study Mahmud et al,[6] employed quasi experimental design using pre and post tests. The experiment was performed in ten science class sessions. The students divided into two groups

(experimental and control) and assigned similar content. The content was being taught by the same teacher. The students of control group was taught in the conventional way without video based resources while teachers for experimental group students used integrated video based resources obtained from the portal. The evaluation is measured for both the groups. A test is distributed among all the students before and after the teaching. The results obtained were analyzed by Statistical Packages for the Social Sciences (SPSS) using descriptive (mean, frequency, percentage & standard deviation) and inferential statistics (t-test). The findings demonstrated that there was a significant difference in students' achievement in the experiment group and is higher as compared to the control group.

All the authors have studied and contributed and claim that support for the attribute treatment interaction (ATI) hypothesis, indicating that verbalizers and visualizers should be taught using different multimedia instruction methods to improve their learning, is weak or non-existent. However, Mayer[12] appealed that researchers and practitioners must search long and hard for the educational implications of learning styles research by taking an evidence-based approach because the implications of learning styles research for educational practice are still less clear. Particularly, online multimedia video lectures have become increasingly common in recent years, whether the three considered video lecture types with various combinations of multimedia elements are unfavorable to verbalizers in terms of learning performance, sustained attention, emotion, and cognitive load warrants further study. The findings of the study are helpful in confirming whether or not the ATI hypothesis exists in different types of multimedia materials and various aspects of learning performance.

In many papers and research the animated characters employed and are often presented in human form[13,14,15] and also portrayed in many fantasy realm as talking animals, insects, or cartoons.

The students learning depend on information and communication technology (ICT). The science and engineering education heavily need this technology. The availability and easy accessibility of resources attract the students towards learning. The quality of technical education demands new and latest technology and application that can also be made available through ICT. The work Sheorey and Gupta[7] focuses on enhancement of skill development through ICT using standard content and making them accessible across all the student population. The authors performed an experiment through videos. The videos were treated a learning tool similar to real time hands-on equipment. The online quizzes and project based

assignments in this environment increased the conceptual understanding and discovery based learning of students. In today's age, the students welcome the task based experiments available through ICT. They found this virtual system more productive.

Video Lectures have effect on the performance of students. They may increase sustained attention, emotion, cognitive load and learning performance. Chen and Hsin Wu[8] used three commonly used video lecture styles and their effect. This style of lecture delivery impacts on student learning. The experiment done in this work shows that the learning performance indicated that the learning performance with lecture capture and picture-in-picture types is superior to that associated with the traditional voice type lecture. The student attention and emotion are the two important aspects of learning. The performance can be improved by focusing these aspects. This work gave a very important difference over conventional lecture format where lack of animation and videos deficit the student attention and therefore less attachment towards teacher.

The online learning can also be affected by music composition software. A work was performed by Huang et al[9] among students of high grades of elementary school who were unfamiliar with the professional music theory. The authors proposed automated software, Automated Composition for Music Education (ACME) that helps the students to compose the rhythm and melody themselves while chord configuration and arrangement are automatically generated.

It was observed that the reaction level of the student was in the favor of learning with impact factor. The work was divided in four themes: teaching materials, learning tools, teaching and student needs. After that a quality questionnaire based on these themes were designed and allowed students to write their opinion freely. This procedure helped to understand the behavior and grasping power of learners on a specific topic.

The effectiveness of e-learning can be improved through multidisciplinary learning group. Dascalu[10] proposed an approach based on Particle Swarm Optimization (PSO). It has been observed that a flexible system can be used by e-learning communities. Here the students were named as enrolled trainees. The proposed system was designed to educate the trainees to make them a good trainer. The method used the collaborating learning paradigm where the trainees make automated recommendations to their users to join a certain learning group, via a PSO algorithm, taking into account their learning interests and their background

knowledge. The learning interests and their background knowledge were taken from the trainees' profiles. The various indicators such as background diversity and similarity between the types of interest of the participants were taken for the purpose. The system provides a platform where a trainee goes through the relevant content, gains some points through problem solving. The background had been created by filling a form having self asses' questions. On the basis of these forms learners have been assigned a trainee group. The study is presented in the context of group building strategies in adults' education.

The online learners have different view towards their society. A comparative study has been done where the students' learning responses and outcomes were analyzed with respect to society Lee.[11]

The work shows why learners change their emotional states by involving various multimedia instructional materials. They applied an experimental design to three groups of students and compared three types of presentation methods: (a) a PowerPoint presentation (b) a PowerPoint presentation guided by a human-like animated character and (c) a PowerPoint presentation guided by a monster-like animated character. The analysis results showed that various types of multimedia instructions result in improved students' learning towards society.

NPTEL: AN INNOVATIVE APPROACH

This is an IT era. A large amount of information can be accessed through websites. NPTEL, especially in engineering education, plays an important role in teaching-learning system. The essential points of NPTEL packages in Computer Science and Engineering (CSE) education such as its expert's design of the course material, its excellent content & quality of the subject, its usefulness in important topics that require diagram, long mathematical expressions and lengthy algorithms.

The several researches have been done and it is found that e-learning has a better effect in student-teaching system. The NPTEL is designed with all the key points of e-learning with quality material for the targeted students. Its availability in Video forms with a variety of channels to access these make it feeling like class room teaching

EVALUATION OF EFFECTIVENESS OF NPTEL

The use of NPTEL can enhance Learning content management systems (LCMS). The present paper proposes following points to evaluate the effectiveness of NPTEL in CSE education over other e-learning systems:

(i) Collection of a group of students of CSE of same standard.
(ii) Identification of attributes for evaluating the performance.
(iii) Analysis of the attributes for same set of students with normal learning.
(iv) Analysis of the attributes for same set of students with NPTEL packages.
(v) Comparison of the above two methodologies.
(vi) Calculation of effectiveness of NPTEL packages on students of CSE.

The performance of student learning in terms of LCMS can be checked with the same data sets of students. At first instant, it is found the significant improvement towards the understanding and knowledge. One of the major reasons of this improvement over other approaches is its quality of material and lecture delivery.

CONCLUSION

The importance of e-learning is an important aspect of today's education systems. The student's learning can be improved by embedding this approach. The various researches have been done on this area. Some of researches have been studies in this paper and found a significant improvement in student's learning. This paper also discusses the effectiveness of NPTEL. The effectiveness of NPTEL is better than other methods due to its good design a, its quality contents and delivery.

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