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Analysis of Virtual Learning Environment and Pedagogical Approaches for Higher Education Institute

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ABSTRACT: This paper reports a descriptive research study on the integration of virtual learning environment and pedagogical approach for higher education in Bangladesh. In this paper we describe how the e-Learning tool is being used for large-scale online training and teaching and thousands of participants at various geographical locations to be trained and taught at the same time. In our years of research and development with large- scale virtual classrooms, we have found that the basic online platform needs to be built with strong e-learning pedagogy considerations such as learner engagement, ease of use, various types of assessment and cost-effectiveness. To support these pedagogy principles, we have done research and built innovations in the form of several unique technical features which have been incorporated into the virtual classroom platform. In addition, the virtual classroom system needs to be operate in an environment with basic infrastructure requirements in order to be effective for large- scale operations. Our current implementation with onecolleges in higher education shows that large-scale training and teaching is working well in the field; the customized online platform has tremendous potential for Bangladesh.

KEY WORDS: virtual learning environment, virtual classroom, VLS,

I.INTRODUCTION

What is virtual learning environment:

A virtual learning environment in educational technology is a Web-based platform for the digital aspects of courses of study, usually within educational institutions. They present resources, activities and interactions within a course structure and provide for the different stages of assessment. Virtual learning environment is not synonymous to a virtual campus. A virtual campus provides University courses, while the name virtual learning environment does not restrict the scope to any age or level. A virtual campus covers a set of courses, often a whole diploma program, while virtual learning environment can be used for smaller parts of a curriculum.

We can describe another way that is virtual learning environment is an online system that allows education materials to be transmitted through the internet to transfer knowledge from organization to employee, or teacher to student. Virtual learning environment examples include the following and more, all of which can be accessed via an online or computer-based system.

Bangladesh is a diverse country with huge population; there is a variety of issues in the educational system which poses many unique challenges. The shortage of experienced and trained teachers is a fundamental issue that cuts across schools, higher education, and skill development. For several years, we have been conducting research and development in building online virtual classrooms. There are two broad strategies that can be employed: train large number of students with the available eminent teachers; and gradually increase the number of eminent teachers by various teacher training programs. While one expert teacher can reach out to thousands of students, there is a need for local teaching assistants to supplement the expert teacher.

To implement the above two solutions, it is very important to make use of online e-learning tools to achieve this large-scale training. But simply making use of existing e-learning tools may not be effective while teaching large number of participants from different locations across the country. In order to achieve the benefit of large-scale training we need to consider the pedagogy requirements of an e-learning tool. Our work and research mainly focuses on implementing

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the pedagogy principles in an e-learning tool, and to find the appropriate operating conditions for the teaching learning environment.
Technolog yisa major influence in the education sector and nowadays some students are more comfortable with online education rather than the traditional classroom approach. With the recent advent of MOOCs (Massive Open Online Courses), online learning has attracted a lot of attention. Several online portals like edX, Coursera, Udemy, and others have been developed and there is a wide variety of online portals that are being developed to reach the learning communities.

Even though MOOCs provide a self-learning environment, they may not be well-suited for all types of learners. Many of the MOOCs have substantial dropout rates. The initial results seem to show that highly motivated and determined learners with excellent computer and communication skills will be able to benefit more from MOOCs. But what will happen to the other types of learners? To meet the educational requirements of a huge population, we need a variety of blended approaches that combine self-learning environment swith the live guidance and mentorship of the expert teachers and a team of teaching assistants.

The popularity of e-learning and blended online learning has paved the way for the development of a variety of e-learning tools. Institutions which are geographically isolated and lack skilled teachers rely on e- learning methodologies to deliver the lectures of highly qualified teachers. In a virtual classroom scenario, the expert teacher is in one place, and the groups of students can be in different geographical locations. Still, these groups of students need minimum infrastructure in order to clearly receive the lecture from the expert teacher. This minimum infrastructure is describe dasavirtual class room. By proper use of smart virtual classrooms it is possible to share intellectual resources, available in one location, with many other locations. Smart virtual classrooms can bring a major change in educational paradigm that will lead to the delivery of top-quality educational programs around the globe. Studies show that for the current generation of students, most of them own a mobile phone or a tablet. This implies that students do not have to only depend on their computers for learning.

To summarize, in order to receive online quality lectures, we fundamentally need an online platform and a smart virtual classroom. However, for the online lectures to be effective for large-scale training, we need to ensure that the pedagogy design considerations are applied to the virtual classroom. The objective of our research work for large-scale education is to provide interactive facilities to the teachers and students so that the live class will be engaging for the students. The platform should be easy to use, cost-effective, and have ways for quick feedback and assessment.

A. OBJECTIVES OF THE STUDY :

This paper describe

- For distance education Virtual learning environment are not restricted. : they also enrich classroom activities.
- Virtual learning environment integrate heterogeneous technologies and multiple pedagogical approaches.
- How we have incorporated the various pedagogy design considerations in e – learning systems in Bangladesh.
- Describe the technical architecture and the technical functions that are needed in such a system and basic infrastructure requirements in Bangladesh.

II. SIGNIFICANCE OF THE STUDY

Virtual learning is a relatively new method of gaining an education in all types of subjects. This system can create online courses and tutorials, arrange live online classes, online lectures, online meetings, group live classes, individual one–on–one tutoring sessions. Virtual learning is accessible to anyone who has a computer, tablet or smart phone where any a students can get a WIFI signal. Virtual learning can usually take place at a time that is convenient for the student. There is no longer any need to be in a classroom at a specific time on a specific day because a student can learn from the comfort of his own home it means that there are no travel costs involved in virtual learning. Any students can study in his own convenience which makes this type of learning preferable for those with young families, those with full time jobs and those who have other responsibilities that require input at specific times or places.

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III. LIMITATION OF THE STUDY

The study has some limitations. The study mainly based on 150 students out of 5000 students and this university is one top graded private university in Bangladesh named Daffodil International University, due to time constraints and all students basically all male and female both are participated as sample respondents and their responds were not analyzed based on their age, gender, social or economic backgrounds. Only 15 teachers were taken for this survey. Due to time constraints the researcher could approach individual students up close to explain the questionnaire and answering process to them. So left some space for confusion and unanswered questions and which are not so enough regarding the context of Bangladesh.

IV. RELATED LITERATURE

There are a number of e-learning software systems developed by universities and other organizations to meet e-learning requirements. This section includes the spectrum of major existing works of digital classroom in the area of pedagogy based design, mobile learning and classroom infrastructure respectively.

There are a variety of digital class technologies and features that are mentioned in various papers. Chen Di et al [14] proposed the use of speech recognition technology that provides non-manual man-machine interaction for the teachers, to reduce mouse and keyboard use in teaching process, which may affect their teaching. KhaledHamdan discuss how a student's behaviour and motivation improves by using the smart board usage. Nishantha et al considered a 4 window display concept for the smart classroom, but they have not considered parameters that affect distance learning like background noise ,lighting, camera, equipment'setc.In the authors proposed two-tier system architecture based on service overlay network (SON) and tree based peer-to-peer (P2P) live streaming network. Many such pilot projects are restricted to smart classroom within a class, and most of them do not support a virtual classroom across various geographical areas.

Here are some of the issues in live virtual classroom for large-scale training. In a large-scale live virtual class, the students and teachers will be in separate geographical locations. Some common issues that students and teacher experience in a large-scale training are as follows:

The teacher is unable to get immediate feedback from the learners (from remote centers with group of participants as well as from the individual ones) regarding the class. Participants will not get opportunity to ask questions at the righttime.

There may not be any communication between the students and teacher. So the teacher will not be able to identify whether the students are following the class or not. The teacher will not be able to estimate the learning state of each remote student.

A teacher's normal way of teaching may be severely affected if the teacher has to operate a computer which distracts the teacher from instructing about the subject matter.

Our objective is to provide a Virtual learning tool considering the pedagogy principles of e-Learning to overcome the above mentioned issues for distance education Virtual learning environments are not restricted.

Distance education is often associated by web-based education. Students from many distance education do not live far away from the physical school but have tight time constraints. Students should strictly maintain the time limit. Sometimes many web-based souses makes learning environment robust because whatever technology is used, all tools have some limitations. But even a small amount of co-operation may solve these type of problems that can hardly can solved at distance. Students can talk with their professor by using online in a specific time and can solve their problems. So distance can't create any problem for virtual learning environment. Heterogeneous technology and multiple pedagogical approaches are integrated by Virtual learning environment environments:

Face to face learning or we can call physical learning environment actually combination of courses, resources formal and informal communication of students and teachers. Similarly a virtual learning environment integrates or supporting

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multiple functions such as information, communication, collaboration, learning and management also. It is clear in virtual learning environment that they have to fulfill any administrative functions such as who is registered to which courses, collecting assessment notes to count credits also. Actually here the word integration I want to expresses in different way. This is technical and pedagogical interaction. For example if any students want some help from his or her professor then he can press help option by using the their software and it opens up to chat and automatically sends to the teacher a request for help and make a summary of what students has done so far in the environment. This example of technical integration that supports pedagogical integration.

With the advancement of technology and availability of it to the mass people, online distant learning has made learning a reality for everybody. Whether you are a student or a professional, you may be in need of some specific and special education that is not always possible to attain physically. Currently, there is a surge of online education in Bangladesh. Anyone can get the education at cheap cost or even free at many of these institutions. Here are some Online education websites of Bangladesh :

A) 10 Minute School :

10 Minute School is one of the latest additions to online in Bangladesh. At First it started as a relatively small initiative which is now growing rapidly with almost 150000 students attending the classes regularly and it is now sponsored by telogaint ROBI and is being endorsed by numerous public figures.[*10minuteschool.com/]*

B) Repto Education Center :

Repto can be labeled as a deshi version of Udemy. The education process here is simple. Some experts prepare a video course and upload it on Repto, students enroll in the courses, and get certified after completion.The courses can be of both types – paid and free. Different fields of education like Programming, Digital Marketing, Graphic design, Photography, English language, MS Office, Database, Entrepreneurship, etc. are the major types of courses you will find at Repto.[https://repto.com.bd/]

C) ShikkhokBatayon :

This site is a project of the government of Bangladesh that aims to bring digitalization of education of our country into a reality. The site mainly is enriched with PPT presentation slide contents explaining different terms and topics of school-level academic studies.There are three mainstreams study contents (General, Madrasa, & Technical) are available there. The contents are prepared and uploaded by different teachers of different schools and madrasas around the country. The site is completely free to use.[https://www.teachers.gov.bd/]

D)Shikkhok.com :

Shikkhok.com is one of the oldest online learning sites in Bangladesh. Unknown to most of the youth, this site has been a hub for knowledge seekers for many years. Founded in 2012, it has been growing with full potential since then. The lectures are designed for everybody to understand.So in the Bangladesh prospect they are trying to develop some virtual learning environment. Now we are trying to describe How we have incorporated the various pedagogy design considerations in e – learning systems in Bangladesh. [http:// *shikkhok.com/]*

E)Structuring collaboration:

The teacher does not simply ask the group members to do sometask together, but specifies a scenario or script. A script includes several phases and, at eachphase, the team has to produce something and the team members have some role to play.Roles such as criticizing the partner's proposal, summarizing what the partner has read,probing the partner for justifications, ... are expected to trigger productive interactions.

F) Regulating interactions:

Even if the efforts to structure collaboration increase the probability that productive interactions would occur, there is no guarantee that the interactions do actually occur. Therefore, collaborative learning would benefit from some external regulation, generally a tutor. The role of this tutor is not to intervene at the task level, but to make sure that all group members participate, to point out contradictions between group members which have not been noticed and so forth. Regulation is however difficult when interactions occur in the virtual space, a teacher cannot for instance regulate synchronous communication in 10 teams of 3 students. Researchers are now developing tools to help teachers to regulate groups and/or to help groups to regulate themselves.

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V. METHODOLOGY

For making the survey paper 15 questions has been used for collect student's responses. This survey was done between March and April of 2018. The respondents of this survey were from Daffodil International university. 10 random students from this university were given the hard copy of questions to write their answer or their responses. 150 students those are the responses from the undergraduate students have been collected for consideration for making this survey. The volunteer took this survey in different location in this university such as library , classroom , canteens, and corridors. To avoid bias among that respondents we try to make this survey separately and before answering the question the volunteer informed them the contents and purpose of the research. The survey paper included 13 multiple choice questions and two descriptive questions. Later we will record our collected responses in an online survey software for example Survey Monkey for data analysis. We are trying to make this survey quantitative and qualitative analysis.

Bangladesh government made a rule for every educational institute that their must be a develop their website. Every educational institute have to buy bd domain. So actually in Bangladesh 100 university/ other educational institute have their own web site. More than 88% teachers and students have the ICT knowledge and 78.6% teachers use multimedia classroom. This survey also found that undergraduate classroom are becoming digitalized and maximum teachers are giving their activities through online though their physical is closed. More than 88% teachers and students have the knowledge in ICT so it could be very easy to establish virtual classroom concept and this survey also find the students are feel comfortable in any virtual classroom concept. This study represents the ways how students are utilizing and cooperating in virtual classroom environment and how teachers can redesigning their course outlines.

Our study seeks to answer questions such as :

1. For study purpose how the students can utilizing the online tools ?
2. In this environment how teachers can maintain their classroom materials?
3. Social, cultural, economic, technical constrains the uses to which the VLE is put?
4. What kinds of VLE based teaching and learning approaches are most effective?

Table -1 :
Time limit of any student to spent in online.

Answer Question		Responces
Morning	Less then 1hr	20.90
	More than 1hr Less then 3hr	16
	More than 3hr less then 5 hr	8
	More then 5 hr	6.2
Afternoon	Less then 1hr	32.16
	More than 1hr Less then 3hr	19
	More than 3hr less then 5 hr	40.32
	More then 5 hr	25
Evening	Less then 1hr	48.16
	More than 1hr Less then 3hr	34
	More than 3hr less then 5 hr	68.12
	More then 5 hr	56
		Total = 150

From this table 1 the survey identifies the spending time for online purpose of any students everyday for various purposes. That means students are very much interested for spending time in online. Some times their use for online is much more expended then 10 hours and some time just use it for reasonable amount of time. This survey did not asked the students what their encourage factors are for spending time online.

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Table 2 :

Topics that are usually browsed online :

Answer choice	Responses
Newspapers	30.12 22
Audio	10.12 5
Video	60.11 30
E-book	31.2 26
E-journals	12.13 10
Specific website	28.14 25
Social Media	80.66 70
Total responders 150	

From this survey we find students are usually browsing all categories form the internet and also familiar to browse E-books and E-journals. This is the most important part of this survey that any instructor can utilize this platform to make educational purpose that is instructor can take online class in virtual learning environment and give the their activities in online and students can submit it also. They can also share course related audio, video, latest news, latest journal and both of them (students and instructor) can be updated in specific topics which is related their courses.

Table 3 :

Visiting web site to get information by students:

Answer choices	Responses
Edusoft	22.6%
Research gate	67.11%
Khan Academy	58.12%
Google	98.8%
Lynda	6.20%
Coursera EdX	7.11% 31.17%
Total respondents 150	

This table 3 shows the percent of the some web or web tools that are use by the students. Some have used different blogs and different website. And students want to use different types of online tools so that both teacher and students

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can utilize this to reduce classroom pressure. In Bangladesh prospect both teacher and students are very much familiar with online and online tool so its very much easy to develop the virtual learning environment.

Table 4 :
Outside the class room students want to do their activities:

Answer Choice	Responses
Submit assignment online	88.96%
Submit presentation online	26.34%
Submit project online	23.12%
Want to give online test	78.88%
Collaborate in group assignment	24.77%
Total responses 150	

From the table 4 this survey shows students want to submit their assignment 88.96 , submit presentation 26.34%, Submit project 23.12%, online test 15.88%. So more research is needed to fine if the students are more interested in normal submission or online assignment. By submitting assignment, project and test, student can save money and time and when taking online exam the teacher can also save time and money by not having to printout or photocopy the questions and answer script. So more research needs to be done to find out teachers experiences on this issues.

Table 5 :
Students intention for E-class features :

Answer choice	Responses
Posting courses	67.44%
Posting assignment	49.88%
Posting announcements	88.12%
Viewing usages statistics	20.12%
Using grad eBook	11.33%
Using courses calendar	71.13%
Communication via virtual chat	21.22%
Total responses 150	

Table 6:
Factor analysis of attitudes to E-class for instructor :

Answer choice	Responses
Students like to use E-class	70.12%
E-class is very easy for students to use	23.22%
E-class is easy for me to use	78.33%
E-class is convenient for students to access	10.9%
Easy to find the performance of any students	4.19%
Interaction with students is easy in E-class	2.12%
Students participate on e-class who do not participate in the class	50.12%
Total Responses 10	

From this table the survey shows though students like the E-class but its not easy for the whole students. This survey shows E-class is very easy for students to use 23.22%, E-class is convenient for students to access 10.9%, Easy to find the performance of any students 4.19%, Interaction with students is easy in E-class 2.12%. before we find students are very much interested to submit their assignment in online but form this table our survey find some of the instructor are not feeling good to make interaction with students is easy in E-class.

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However, what is more specific to virtual learning environments is the set of activities within which students construct and share objects. Most often these objects are Web pages. Writing activities (producing syntheses, study reports, newspapers,) are very popular in schools. Students are not restricted to consuming Web information, they become information producers, they enter into the game. There is quite a difference between writing a critique of a novel which will be read only by the teacher or which can be read by potentially anybody.

the notion of a learning activity in virtual learning environments refers to something richer than in individual courseware, closer to the notion of project. The difference between other constructivist environments and what virtual environments potentially offer can be described as making students not only active, but also actors, i.e. members and contributors of the social and information space.
http://ali.www.media.mit.edu/~flavia/CityOfNews.html

VI. RESULT AND ANALYSIS

While surveying, the volunteers encountered s list of question from the students and instructors which are given below for analyze the results:

1. Lack of information or sometime information is not organized properly.
2. Because of less efficiency they need to spent more valuable time to collect information.
3. I can't find the specific thing what I want
4. Search engine are not complete properly in their website, So I can't find the specific item.
5. Don't want to pay to access online sources.
6. Sometimes difficult to find Facebook groups for the course.
7. Difficult to find reliable sites.
8. Some websites asked money for get the valuable contact.
9. Internet does not work properly. Low connection is the disadvantages to upload assignment and submission date will over.
10. Difficult to understand lab assignment. Its not enough to clarify everything in the chat.Time limit is one of the big factors.

To solve this type of problem our volunteers ask the students what their opinion is for solving this kind of problems and they said:

1. Online classes should be made as smaller classes which will not be a burden for teacher when communicating with students in online.
2. Teacher can tell the which specific link to follow.
3. A teacher should give all inclusive materials of our lecture.
4. Make a schedule in a week for helping face to face and answering our questions.
5. Through advice and pointing out the job opportunities.
6. Teachers should be available for consultation and video links should be provided for any lecture.
7. Teacher can provide scholarly websites and articles.
8. Counseling outside the classroom.
9. Providing the teaching content on university web site also.
10. Counseling hour should be strictly maintained.

VII. CONCLUTION AND FUTURE WORK

Here are some of the major types of content collaboration and sharing that can take place:

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- Video Sharing: The teacher can share a video from hard- disk or YouTube with students using this option. When teacher pauses at certain points of time, it gets paused at all the student nodes.
- Desktop Sharing: Using desktop sharing, a teacher can share his desktop with his students.
- Document Sharing: The teacher can share instructional materials like PowerPoint presentation, PDF, etc. with his students using this option. When teacher changes the page, it gets changed at all the student nodes also.
- Whiteboard: The teacher can write on the whiteboard the similar to the normal board in a real classroom. All students can view the drawings in real time. Teacher can use external hardware's also for this, such as an electronic writing pad, or a smart board.

Teachers can interact with the learners in several ways to keep them engaged:

- Polling feature can be used for immediate feedback. Teacher can use this frequently to check whether the students are following the lecture or not and to make the class more interactive.
- Question interface with voting mechanism: This allows students to post questions during class, without interrupting the teacher. Teacher can look at these questions at any time and can answer them. Students can vote for a question if they like a specific question. This not only avoids duplicate questions, but also help the teacher to identify the topics that are not very clear to a large number of students.
- Hand raise option: If the students have some doubt, they can use this option to let the teacher know about it. Teacher can select these students for audio-video interaction.

So from this survey we find that students are already familiar with many online learning management tools. So it will be very easy for any instructor to easily integrate the students to active many virtual classroom activities. Now a days instructors should take the responsibilities to make them aware of the educational tools and materials available in online and should give proper feedbacks witch assignment submitted by the students in online that can inspire, encourage and motivate the other students to increase their online study.
In future, further research can be done by the increased number of university both private and public universities and improve the quality and reliability of the data. Research questions focusing on the motivational factor of virtual learning and teaching environment and further research can be done by analyzing students responses by their age, gender, or economical backgrounds.

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