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Learner Experience of Technology Enabled Learning in Indian University

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Abstract:

Preparing today's learner for Global citizenship is a great challenge in higher education. Using technology to assist teachers in transmitting information in the classroom is a traditional solution, which does not help in developing learner skills of knowledge generation, collaboration and co-creation of content. An empirical question was to find if Technology Enabled Learning in Blended environments would be one of the probable solutions. If teachers try creating such environments, what challenges do they face? How do students' react to such minimal lecture and technology-enabled environments? In order to find answers to such challenges, fifteen higher education teachers from an Indian University implemented technology-enabled learning for one semester. The present paper presents students' experiences of learning through this approach. Total 600+ students were under intervention out of which 230 students responded to the questionnaire. Analysis revealed information about variety of formats of resources, modalities, ICT tools used by teachers in TEL, learner opinion regarding the resources and activities, perceived benefits and limitations of TEL, etc. Overall positive opinion about uses and advantages of TEL is expressed by learners. Use of LMS is appreciated by almost all students expressing mainly that re-visiting resources as per need and convenience was possible due to LMS. Online discussions boosted students' confidence. Resources other than teachers' lectures allowed learners to understand different perspectives. Learner-centred activities allowed them to express their own views.

Two to three students of each of the classes under intervention appeared for structured interviews. Their views matched with the average views expressed through questionnaire. Students appreciated variety of resources uploaded, but a few also complained about overwhelming number of resources uploaded for certain topics. As a result, students experienced paucity of time and could not view all uploaded resources.

Introduction

The area of use of technology in education is a vast area of exploration and experiments. The field has a across a wide range of application from being used merely as a tool in teacher's hand, to the entire learning process being mediated by technology integration. Technology Enabled Learning (TEL), if implemented systematically, can lead to learner-centred blended environments. Do such technology enabled learning environments benefit learners in any manner? Does TEL help making learners global citizens? Or does it prove as an obstacle in the learning process of students? A TEL project on a wider scale was implemented in SNDT Women's University, Mumbai, India, the first women's university in South-East Asia, to find answers of such questions.

Technology Enabled Learning

Technology Enabled Learning (TEL) refers to the use of technology (Information and Communication Technologies) to facilitate the process of learning. Kirkwood & Price (2016) state that TEL refers to the application of some form of digital technology to teaching and/or learning in an educational context. TEL expected to provide freedom to both, the teacher and the students, to plan the classroom activities, which enable learning through use of Information and Communication Technology (ICT) tools, platforms to support learning.

There are seemingly many benefits of TEL and many research studies (Lopez, 2015; Sykes, Oskoz and Thorne, 2008; Percy, 2009; Youssef & Dahmani, 2008) have highlighted several benefits. According the authors, the ICT tools consist of Learning Management system which offers a lot of flexibility in using the learning

resources shared by the teacher. Accessibility is a great benefit for the students. TEL enables access to globally designed and developed OER. Many ICT tools are used for communication among students. They can discuss, work, add, edit, and co-create knowledge using these Tools. Many ICT tools assist in cooperative learning and therefore TEL provides many opportunities to students for collaboration. Many research studies have shown TEL is more effective in terms of student achievement of higher order objectives as compared to traditional and face to face teaching learning process. Teachers perceive TEL as an important pedagogy which facilitate student learning to a great extent. However, there is a need for training the teachers in shifting from traditional face to face classroom to TEL based blended and/or Flipped classroom.

Blended Learning

Blended learning, the intelligent and thoughtful mix of online and face-to-face contact time between teaching staff and students, is being preferred by higher education teachers across the world. The percentage share of each mode may differ from faculty to faculty, but there is a blend of both. Blended learning is a means to provide more engaging, quality-driven experiences by integrating or replacing portions of face-to-face with online or technology-enabled learning (Clark, Kaw, Lou, Scott and Besterfield-Sacre, 2017; Garrison & Vaughan, 2008; Bourne, Harris & Mayadas, 2005; Dziuban, Hartman, Juge, Moskal & Sorg, 2006).

Review of Research Studies

TEL is comparatively a recent phenomenon, which is being explored as an effective alternative to teacher-centred teaching-learning process. Several research studies are being undertaken with an aim to understand this phenomenon from various angles.

Lee, Shen, & Tsai (2008) and Felea, Dobrea, & Albăstroi (2011) investigated the effectiveness of TEL. The first study analysed interactions between TEL and pedagogies whereas the other study focussed on student perception and attitude towards TEL. It was demonstrated in the first study that PBL via e-learning facilitated development of students' skills of applying computer software in general, and students of vocational schools in Taiwan in particular. Findings of the later study prove that students prefer course formats implying blended learning components. Arrosagaray, González-Peiteado, Pino-Juste and Rodríguez-López (2019) conducted a comparative study of Spanish adult students' attitudes towards ICT in three different formal learning settings, i.e. face-to-face, blended and distance learning modes. The students' self-perceived confidence in digital competence, the ICT impact on their learning and their perception of the learning potential of ICT was measured and compared. The result revealed that students acknowledge the beneficial effect or impact of ICT on their learning and expect their learning to be of high value in the future. Sahin A., Cavlazoglu, B., & Zeytuncu, Y. E. (2015) found that students in the flipped classroom preferred watching flipped classroom videos more often than reading sections from the textbook. The study also revealed increase in student achievement in the subject after flipped classroom. Richard W., Martin J. & Julie V. (2018) studied the extent of investment of UK government in TEL and its overall impact in education sector. Though the TEL tools and support are increasing day by day, the researchers found that pedagogy is not changing much.

The studies on TEL have consistently shown a positive impact on students learning. Use of blended learning environments is preferred by higher education students. The studies are showing positive results in many western universities and educational institutions. Such large scale institutional level efforts are needed in India. Before introducing TEL environments at SNTD Women's University on a large scale, learner perception was studied through a survey research. The results of the survey established need of TEL strongly. (Shinde, 2016)

Deriving from the benefits of TEL and positive attitude of teachers and students demonstrated in baseline survey at SNTD Women's University, Mumbai, it was decided to study effectiveness of TEL in the Indian University environment.

Research Questions

The study aimed at understanding the reactions of participating students as it was a new experience for them.

The following research questions were identified:

1. How do students perceive the TEL intervention?
2. Do learners find TEL useful? Why?
3. Do learners find technology enabled learning feasible? What are various challenges for them in learning through TEL?

The scope of the study was limited to 8 higher education institutes situated on two campuses of the State University in the same city. The institutes consisted of 6 University departments offering programmes in Library and Information Science, Management, Education, Educational Technology and Psychology and two conducted colleges offering undergraduate programmes in technology. The paper focuses only on the data obtained through questionnaire and interviews of students. Data regarding scholastic achievement, teacher perception is not analysed and discussed in the current paper.

Research Methodology

A mixed method approach was used for the study. Data regarding student experience was gathered through descriptive survey method. Analysis of the intervention was planned towards the completion and hence the sequential explanatory design of mixed method was used. (Creswell, Plano Clark, Gutmann, Hanson, 2003)

Since the intervention occurred as a unique and innovative phenomenon in the University, perceptions of participant students were studied about the intervention. Phenomenology approach was used for qualitative analysis. (Groenewald, T., 2004).

Sample

Final team of 15 faculty members consisted of 6 male and 14 female teachers. The students enrolled for the courses served as sample for the study. Though initial sample was about 650 students, some students dropped out or else remained absent during final exams and hence 628 students were considered as the final sample.

Out of 628 students of the current year, 375 students received TEL from 2 different teachers. Twenty one students were taught one more course through TEL by the third teacher.

Tools and Techniques of data Collection

Data collection was planned via two different tools and techniques:

Questionnaire for students

A questionnaire was designed to collect demographic information of the student sample and opinion about the instructional strategies and resources related to technology enabled learning environments. The objectives of the questionnaire were to:

1. Collect demographic information of students, viz. programme, institute, income-group, possession and accessibility of technology devices, availability of internet and academic background in terms of overall performance
2. Collect opinion about use of possible resources and activities by instructors
3. Collect opinion about small group learning environments

Fifteen items each were constructed for collecting opinions related to Objectives 2 and 3. The rating scale was used to collect these opinions. Rating scale designed for Objective 2 consisted of 10 positive and 5 negative statements whereas rating scale designed for the Objective 3 consisted of 8 positive and 7 negative statements. The reliability of the tool was established before this study was conducted. In order to check the reliability of the tool, test-retest method was used. The correlation of test and retest mean scores was 0.755 demonstrating high positive correlation.

Interviews for students

Students scoring the highest, the lowest and the average scores from each class under intervention were identified and interviewed. Total 26 students were interviewed to understand how they perceived the TEL experience.

Intervention

TEL was implemented as a systematic project. Fifteen higher education teachers were trained for TEL through 5-day capacity building workshop. Teacher participants were oriented in blended learning, planning for ICT integration and Moodle LMS.

All the courses were of 4 credits which required 120 hours of study. Teachers chunked content, designed learning outcomes and developed session plans. They identified OERs, created own eResources such as screen-cast videos and planned learning activities. They accordingly designed the courses on LMS and uploaded resources on the same. They had planned week-wise interaction on Moodle.

Several ICT Tools such as Padlet, Blog, Google collaborative tools were explored and used for teaching-learning activities other than using LMS.

Discussions, group-work, group presentations and a few co-operative strategies were implemented in the class. Internal assessment was conducted through various activities, project submissions, Moodle based Quizzes, etc. as per university directives.

Data collection activities such as administering tool to students and interviewing students was done as per plan. Questionnaire link was uploaded in their LMS courses and also teachers were requested to send the link over cellphones.

Data Analysis

Analysis of Questionnaire for students to understand student opinion

A Questionnaire was designed to collect demographic information and opinion about the instructional strategies and resources related to technology enabled learning environments. Out of 628, 230 (36.6%) students responded to the questionnaire.

Availability of Access Devices

Nearly 50% students had desktops or else laptops exclusively for them with other devices such as smart-phone. Eighty percent students claimed that they possess smart-phones. Data establishes the fact that 100% students had at least one or more devices available with them to participate in TEL, though many had to depend on smart-phones to participate in various activities.

Except one student, all other student had wi-fi or else broadband access at home (66%), at the institute (33%) and through data-pack (64%).

Perceived Opinions of students

Study of students' opinion regarding use of TEL and small group learning activities was done. Analysis of the data obtained through the Questionnaire is presented in the following paragraphs:

Resources/ material shared by teachers

The question regarding nature and extent of resources was asked with a few options. Table 2 presents frequency of uploading such resources.

Table 2. Availability with Frequency of Resources/ material shared by Teachers

	Mean	SD
Her/his own presentation slides used in the class	2.122	1.258
Her/his own notes (Hard or soft copy)	2.478	1.132
Videos on the topic (e.g. links to YouTube, MIT/NPTEL programmes etc.)	2.426	1.179
Web-articles	1.757	1.197
Interactive multimedia (graphics, animations, etc.)	1.596	1.217
Web based presentations (e.g. Slideshare)	1.878	1.286
eBooks	1.687	1.185
Articles/research papers from Databases such as JStore, ProQuest, etc.	1.387	1.248

Faculty preferred to provide own notes, own presentations and links of videos. More than 60% students claimed that videos were provided frequently. Use of database articles and papers and Interactive multimedia appears less. This reflects the need of developing interactive eContents to support video formats. Since more undergraduate students formed most of the sample, use of databases is minimum. The data majorly reinforces that the teachers had shared several resources frequently with the students.

Use of eResources

The question regarding various patterns of interactions with the eResources was asked. Purposes such as revision, self-study, self-preparation followed by discussion, presentation, group-work were provided as options.

About 80% students claim that the resources were mainly provided for revision of the topic after teaching in the class. This highlights the need of the focus on Flipped Learning. Self-study followed by classroom discussion or group work seemed to be preferred more. All activities gained more than 2.5 mean with low SD, which indicates that lecture method was minimal. Only 6-8% students claim that their teachers did not plan any presentations or discussions in the class, but provided material only for revision.

Online activities

The information regarding perceived frequency of conducting online activities was studied, which is presented in Table 3.

Table 3. Conduct of Online activities

Statements	Mean	SD
Online discussion forum	2.201	1.319
Uploading assignment on Moodle LMS	3.184	0.981
Online concept-mapping	2.518	1.224
Online slide preparations	2.120	1.329
ePortfolio	1.128	1.174
Blogging	1.407	1.253

Mean for use of LMS is high. All except two students claimed the use of Moodle LMS out of which more than 80% claim the frequent use of LMS. All teachers have continued the use of Moodle even for the next semesters, which conveys the success of using LMS in teaching-learning. More than 77% students mentioned about the use of Concept-mapping, gaining mean 2.5, which ensures generation of meta-cognitive knowledge in the class. Classroom discussions are mainly supported by online discussions and even online slide preparation activity seemed popular. ePortfolio and Blogging seem to be hardly used. More inputs, support on these tools may change the scenario.

Students' Views about use of ICT

It was essential to study students' views about eResources and use of ICT tools after an intervention of one semester. The rating scale with 15 statements was provided to rate statements on the scale 'strongly disagree' to 'strongly agree'. Table 4 presents students' opinion about use of eResources and ICT tools.

Table 4. Students' Views about use of eResources and ICT tools

Statements	Mean (4-1)	SD
1. providing different perspectives, achieving conceptual clarity, learning at own pace, availability of quality resources, feeling responsibility of learning, providing scope for revision, online forums helping in developing confidence, self-expression, online tasks leading to better development of knowledge and social personality	above 3.00	Below .75

2. watching video leading to wastage of time, downloading and viewing online resources a time-consuming and a boring task, teachers avoiding their responsibility of teaching, logging in LMS every day as an additional responsibility, Need of teacher's explanation,	Below 3.00 Above 2.00	Below .75
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Data showed very high mean towards acceptance and benefits towards TEL. Benefits such as getting different perspectives through online discussions, self-expression, self-paced learning, quality resources, and feeling of responsibility gained more than 3 mean out of 4. Even negative statements were disagreed by students gaining more than 2.7 positive mean weightage.

Though students agree with the benefits of material, about 70% students feel that teacher's explanation is always needed. More use of cooperative learning strategies and teacher-made resources may reduce the extent of the need of teacher's explanation. 25% students find videos less useful. This calls for need of more studies regarding use of videos in learning. Bandwidth issue also plays major role in acceptance of long video formats.

It can be concluded that TEL intervention is perceived advantageous by most of the students. Positive attitude towards the TEL is a motivating factor for the teachers and the institute.

Students' Views about use of small group or pair activities in the classroom

Learner-centred classrooms cannot be achieved merely through use of technology. Integration of technology in classroom learning is essential. Small group learning pedagogies are equally important while practicing TEL.

Increase in enthusiasm, deeper understanding, learning from peers' perspective, feeling of ownership of learning, escape from boredom from passive listening and development of confidence are majorly highlighted benefits of group discussions and learner-centred activities.

More than 85% students agree with statements that indicate benefits of working with peers in small groups. Though in previous rating scale, many students believed that teacher's direct instruction is more useful, 83% students here agree that understanding is better if discussed with peers. Even 78% students believe that friends' perspectives help them to understand the topic better.

Some limitations are perceived as a challenge by many students. Students feel that small group activities are hectic, time-consuming, and 90% students feel that they should not be deprived of teacher's lectures and notes. Changes in assessment strategies may contribute towards change in this opinion. Even small, motivating tasks need to be planned for small groups.

Overall positive opinion towards small-group learning is demonstrated by students under intervention.

Learner Experience through Interviews

When a new intervention is introduced, mere achievement scores generally fail or are felt inadequate in gauging success or failure of the intervention. Learner-centred or constructivist approaches do not only aim at increase in achievement scores but also development of students on other aspects such as exposure to resources of information, soft-skills, co-creation and knowledge generation processes. It was, therefore, decided to find out students' perceptions about the phenomenon at the end of the intervention.

The responses of students are categorized into 11 areas which are discussed in the subsequent paragraphs.

Introduction to the course through Technology Enabled Learning

Many teachers oriented their students for using Moodle in the beginning of the course. Some students still claimed to be little nervous in the beginning as it was their first experience with technology enabled learning. Few students mentioned being scared and worried due to unknown nature of the pedagogy. They were not sure about availability of infrastructural facilities; many considered it as additional work or even burden.

Irrespective of prior experience, students gradually started taking interest in this intervention.

Change in Learning Experience

Students, especially from non-technology background took time to adjust to this new pedagogical approach. They were not very sure if they would be able to adjust to this new mode of teaching-learning. However, this new approach exposed them to variety of resources in the form of pdf files, videos, docs, etc. and it was welcomed by many. Majority of students considered Moodle as library where they could access all the uploaded resources.

Some students liked this concept as it gave them freedom to express their views and opinions on forums and it made learning very interactive. Many considered it different from their routine experience as it helped them break the monotony.

Accessing Resources

As mentioned earlier, students appreciated variety of resources uploaded on Moodle by their respective teachers. They liked the precise nature of resources uploaded. Among the types of resources, Video resources were widely appreciated. Many students preferred short videos over long videos.

Though students appreciated variety of resources uploaded, few complained about overwhelming number of resources uploaded for certain topics.

Challenges faced while accessing Moodle

During initial phase, students faced some problems like remembering Moodle login details, infrastructural limitations like availability of computer lab or internet facility (in some cases), and technology related issues like accessing Moodle.

Teachers helped students with these difficulties, many students tried to resolve issues either on their own or with the help of their peers. This helped students to develop their independence and troubleshooting ability.

Another issue was of being notified by Moodle regarding assignment submission dates or quiz timings.

However, this was the initial blip. Teacher resolved the issues with help of technical guidance from mentors and oriented their students.

Discussion forum

Discussion forum was one of the most appreciated features of LMS for many students. Students posted their views, opinions, reflection, etc. on discussion forum.

Some students found it repetitive as they were asked to post essence of the group/class discussion on the discussion forum.

Assignment and Quizzes

Some students faced problem in submitting their assignment on Moodle due to file size constraint. They resolved these issues by raising the concerns to their respective teachers.

However, many students liked the concept of online submission of assignments. It granted them freedom to submit the assignments even from home. Some students also acknowledged this effort to save paper.

Attending quizzes was another interesting activity for students. Many advocated the usability of this feature as it allowed them to appear for test without any restriction of place. In addition, they appreciated the instant feedback received after the test.

According to them, it helped them to identify areas where they need to pay more attention.

Using other ICT tools

Apart from Moodle, students participated in various learning activities conducted using different ICT tools like Padlet, Blogs, Google Drawings, etc.

Many of them were given some orientation or demo session in advance for using these ICT tools. Almost all students liked and appreciated use of different ICT tools in teaching - learning.

Classroom Activities

Classroom activities helped students to raise questions, solve their doubts and learn in more meaningful way. Many students also claimed to develop different life skills by means of these classroom activities.

Some of the favourite activities were concept mapping, group discussion, group presentation, etc. Many students mentioned about developing communication skills, leadership skills, group management, time management skill, etc.

Student participation

Most of the students were happy and enthusiastic to participate in various group activities. They were comfortable sharing their views and opinions with other fellow students. However, this was not the scenario throughout. Some of the students mentioned that it was bit awkward and difficult for them in the beginning. In the beginning, some students faced problems like idle group members, conflicts in the group, language of discussion, dominance of certain group members, etc.

Overall Experience

Almost all students liked this intervention to the core. Some were apprehensive about it due to the fear of technology. However, these students overcame their fear eventually as they were curious, interested and constantly motivated by their teachers.

They felt responsible for their own learning. Students liked flexibility they experienced in terms of time of submissions, place for accessing resources or appearing for a quiz, pace of learning, etc.

Almost all the students were very happy about this experience. They wished to participate in similar experience for their next semester. Overall, it was a pleasant and interesting learning experience for them.

Conclusion

TEL initiative can be considered as a major milestone in systematic efforts towards 21st century education. Though discrete efforts towards TEL were initiated for the past few months, involvement of 15 plus faculty with more than 600 students was a major achievement. Qualitative data is more valuable in case of such innovations in the field of education. Students showed significant acceptance to TEL. Students perceived greater benefits of TEL through online discussions, self-expression, self-paced learning, quality resources, and they also felt more responsible for their learning. Many lessons are learnt during this process. The most important impact of the project was voluntary continuation of all faculty during the next year and also for other courses.

The study is a path-setting effort in Indian higher education system. The aim for the future studies may be to achieve at least 60-80% TEL implementation in the institutes. The present study mainly focuses on learning experiences and therefore deals with qualitative data. Several quantitative studies can be planned for studying effects and relations among related variables.

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