

PST Framework for Hybrid Learning

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Abstract

Hybrid learning refers to learning that happens both in physical space and virtual space with a view to combine and boost both the environments. Here, physical space refers to on-site environment and virtual space refers to online environment. Initially, it was considered as virtual dimension that includes synchronous and asynchronous interaction between teacher and taught. Here, students may access online learning at any moment by connecting with technological learning tools. At present, it refers to mixing of face-to-face and distance interaction where real time and time delay are implied.

PST framework paves the way for new learning spaces by providing appropriate design and operation. This framework helps stakeholders for better teaching learning spaces with regard to pedagogical, technological and physical dimensions. It also provides learning experiences holistically as well as objectively in the domain of pedagogy, technology and space. In this paper, it is tried to discuss about PST framework and models of hybrid learning. PST framework provides a systematic lens for designing and evaluating educational environments. Models of hybrid learning help in achieving the goal of hybrid learning by providing the pedagogical strategies.

Keywords: Hybrid Learning, PST Framework, Scenarios of Hybrid Learning, Models of Hybrid Learning, Elements of Hybrid Learning

1.0 Introduction

The notion of learning space has been relocated and enriched by technology (Johnson & Lomas, 2005). Maloney (2007) has mentioned that technological tools will provide a kind of potentiality for enhancing interactivity and engagement by allowing online communication, exchange of content and production. Web-based technologies provide learning space for acquiring knowledge, improving communication skills, and sharing ideas with a view to promote collaborative learning. Universities are the centres for innovation through technology (Laurillard, 2002). The universities function not only to promote societal aspirations, but also to cultivate students' knowledge and their active social engagement. This could be possible through creation of positive and innovative learning environment in which technology takes vital role for teaching and learning (Temple, 2008).

Smyth (2011) has emphasised that technologies help for communicating and connecting teachers as well as peers for knowledge creation and skill attainment in educational process. Uses of technology are prone to participate and more comfortable in technology-driven environment in order to acquire knowledge and skills. Conole et al. (2008) has found that students are selecting appropriate technologies for their personal learning needs and they are trying to enrich themselves in technology-enhanced learning environment. Oblinger (2005) has added that instructional

designs are making students more participative and active in learning with the help of technologies in desired learning spaces.

2.0 Review of Related Literature

The core objective of hybrid learning is to mix classroom teaching methods, learning styles, resource formats, range of technologies, range of expertise to enhance learning. It can be achieved through variety of media including main frame-based, video-based or web-based. There is no fixed way for use of technologies in hybrid learning. Hybrid learning is thoughtfully planned combination of multiple approaches of pedagogy, various delivery modalities, online and face-to-face learning to provide the most efficient and effective learning instruction based on self-paced, collaborative, critical, reflective and inquiry-based study. Hybrid learning is the most suitable for learning as it has the potential to increase and extend teacher-student and student-student connectivity and builds relationships even more than in traditional or online learning.

Hafiz (2022) has studied the effect of flipped learning on learners' linguistic achievement. Findings of the study revealed that the performance of learners was progressed due to change in pedagogical approach to teaching English using flipped approach. Kazu and Yalchin (2022) found that Hybrid learning had significant effect on the academic achievement of students in the discipline of Biology and science related subjects.

Sarma and Devi (2021) have revealed that blended learning is an effective method for students of higher education in Assam. Anbalagan (2021) concluded that flipped learning was an effective approach to enhance mathematical achievement in Mathematics education among prospective teachers of B. Ed. Colleges. Ekta (2021) investigated that the intervention programme of flipped classroom had significant effect on level of meta-cognition, level of classroom and also level of academic achievement.

Sharma (2021) studied the effect of blended learning on achievement of English and academic anxiety among secondary school students in relation to self-efficacy. This study revealed that academic blended learning strategy may reduce academic anxiety and improves achievement in English. At the same time, self-efficacy was strengthened through on-site and online learning. Neetika (2021) has investigated the effect of mixed learning on academic performance, motivation, and course satisfaction in Science among adolescents. The findings revealed that mixed learning cause more effective and beneficial for adolescents to promote and sustain their motivation level, course satisfaction and academic performance.

Zhang and Zhu (2018) have found that hybrid learning was the main learning strategy to improve academic brilliance. It was positive factor for achieving learning outcomes in expected manner. It was better than the face-to-face interaction. They also revealed that hybrid learning was the important instructional strategy for independent learning and clear interaction. Hybrid learning also helps to create positive teaching learning environment which is active, interactive, inspiring, encouraging, flexible and holistic. Chitra (2017) has observed the impact of blended learning in learning of science among 9th grade students. She revealed that learning Science through blended learning was more effective than the traditional approach.

Banditvilai (2016) had strongly emphasized that using the hybrid learning might be entailed with the use of physical and digital spaces with a view to motivate students to engage as well as interact in teaching English as second language as well as teaching English as foreign language. Josephine (2016) has clearly revealed that blended learning was a prominent factor to increase performance in academic and performance in teaching of physical science. Experimentally, the investigator has observed the academic achievement scores in post-test.

Liu (2013) has found that hybrid learning was encouraged among students. Then the students developed autonomous learning by decreasing anxiety in communication and increasing academic writing competence. The hybrid learning was also strong factor for improving interaction among students in classroom situation.

Tayebinik and Puteh (2013) have emphasised the views of hybrid learning in place of face-to-face learning or online learning. Hybrid learning may promote students' engagement in developing knowledge independently. Hybrid learning makes students to learn very effectively by using various synchronous and asynchronous technological learning tools.

Manan et al. (2012) indicated that hybrid learning was a factor for improving students' authentic learning. They also added that use of on-site and online technological tools may be helpful for interacting among students by using various technological tools like, Facebook, Instagram, Twitter etc. Marsh (2012) added that hybrid learning could provide many merits for students and teachers as compared to traditional approach. Students' language learning skills, collaborative learning, active engagement, effective interaction and effective language practice, individualised language learning and the language autonomy could be strengthened through hybrid learning.

Krishnan (2011) studied the effect of blended learning strategy on higher order thinking and learning Science among secondary school students. The results of the study revealed that blended learning strategy is very influencing factor for developing problem solving, scientific thinking, critical thinking and process skills in Science and academic achievement in Science. Yoon and Lee (2010) had found that use of hybrid learning could develop target language with regard to listening, speaking, reading and writing. Sharma and Barrett (2007) have remarked that hybrid learning was the more effective strategy for developing study skills like- note making, note taking, listening skills, speaking skills, reading skills and writing skills in language. Subsequently, hybrid learning would help to improve students' engagement, motivation and learning environment. Computer enriched learning and face-to-face interaction are the main two components to implement hybrid learning effectively.

Leakey and Ranchoux (2006) found that most of the students were preferring to get learning experiences through hybrid learning rather than traditional classroom learning. they also indicated that hybrid learning was better alternate option than the classroom learning. Banados (2006) stated that blended learning has been identified as a technology combined instruction in teaching learning process. Blended learning has various advantages in terms of delivery of the content and assessment through online tools. Harkar and Koutsantoni (2005) concluded that hybrid learning would help to increase retention of the students in comparison to distance learning. Hybrid learning would view positive learning outcome specifically for learning English for academic purposes. Dziuban et al. (2004) stressed that hybrid learning would show its potentiality in improving learning outcomes of students in compared to fully online indicated course. Singh and Reed (2001) expressed that hybrid learning would increase effectiveness of learning and development of cost-optimisation. Hybrid learning is also an influencing factor in minimising the interaction gap between physical space and virtual space.

3.0 Significance of the study

Keeping in view the importance of various reviews on hybrid learning, it is thought to do study about PST framework and models of hybrid learning in particular and hybrid learning in general. It is very essential to study about different aspects of hybrid learning as it cultivates 21st century skills. Hybrid learning helps in developing critical thinking and creativity, collaboration and communication, digital literacy among the students which are essential skills for life and career. It also provides resilience and adaptability in unpredictable disruptions. Maximum accessibility and equity become possible with hybrid learning environment because it breaks down the traditional barriers to education. It also optimizes the learning experience as it allows teachers to strategically use the benefits of both online and onsite environments.

4.0 Objectives of the paper

The objectives of this paper are as follows:

- To discuss about the PST framework for hybrid learning.

- To discuss about various hybrid learning models.

5.0 Materials and Methods

As per materials and methods are concerned, this paper is primarily based on secondary data collected through books, journal and internet sources. Hence the discussion of this paper is made on the basis of this collected data. Moreover, some personal observation and views are added in this paper.

6.0 Discussion

6.1 Education as a Hybrid Process

At present, educational setting for learning has become a hybrid context bouncing from physical to digital spaces with technology involvement. The learners should depend on the use of set of technological tools to accomplish expected learning outcomes. Manciaracina (2020) has revealed that learning experiences are eventually meshed on-site and online activities. The on-site environment will work in synergy with the online environment through new teaching approaches and new learning styles. Tovmassian (2004) has stressed upon that internet has been offering new learning opportunities in hybrid environment in comparison to traditional learning environment. COVID 19 emergency made universities to move from on-site to online by using various resources and services which gradually moved towards hybrid learning processes. Huang et al. (2019) have revealed that educational technology approaches in education have rapidly expanded in recent years with various advanced approaches like mobile technologies, augmented realities, virtual realities, social networking, simulation, cloud computing, collaborative learning, flipped classroom and many more.

Conole et al. (2008) has stated that technologies provide variety of alternatives for interaction and communication with regard to learning. Trentin (2015) has also admitted that virtual space allows learners to learn virtually anywhere and anytime. Lowyck (2014) has pointed out that technological learning environment is not effective alone and it has to be adopted by the learners in tune with their abilities, self-management, and perspectives on technology. At present, classroom has become a virtual space in which students can select effective technological instruments for better understanding of the phenomenon.

6.2 Concept of Hybrid Learning:

Hybrid learning refers to learning that happens both in physical space and virtual space with a view to combine and boost both the environments. Here, physical space refers to on-site environment and virtual space refers to online environment. Initially, it was considered as virtual dimension that includes synchronous and asynchronous interaction between teacher and taught. Here, students may access online learning at any moment by connecting with technological learning tools. At present, it refers to mixing of face-to-face and distance interaction where real time and time delay are implied. The students should depend on use of set of technological tools to carry out events in order to promote learning progressively. Graham (2006) has defined hybrid learning as the fusion of traditional face-to-face learning and computer-mediated and e-learning. Trentin (2016) added that hybrid refers to interaction space between student and teacher by reducing the line between physical space and digital space. Dewey (2014) also added that online and on-site teaching will provide combination of various instructional methods through which students can take practical action and can understand the right way to mix the approaches.

The main objective of hybrid learning is to strengthen learning by mixing of live e-learning, face-to-face learning, self-paced learning, computer-mediated learning and mobile learning. It is an effective combination of different modes of delivery, models of teaching and styles of learning as well as applying them in a meaningful learning environment. It provides a unique learning experience in space and time. It is people-centric that mix classroom teaching methods, learning styles, resource formats, range of technologies, range of expertise to enhance

learning. It can be achieved through variety of media including main frame-based, video-based or web-based. There is no fixed way for use of technologies in hybrid learning.

In order to give the most effective and efficient learning instruction based on self-paced, collaborative, critical, reflective, and inquiry-based study, hybrid learning is the strategically planned integration of numerous pedagogical approaches, varied delivery modalities, online learning, and face-to-face learning. Teachers and students can now readily connect in online learning settings as a result of the expanding usage of technology and the growth of learning platforms. In addition to their classroom activities, this aids the teacher in setting up and managing online activities for the students where they can talk, share information, ask questions, access learning materials, and complete assignments.

6.3 PST Framework for Hybrid Learning:

PST framework looks into the hybrid learning and it acts as a reference point for making integrated plan in educational scenario in order to make learning as innovative practice (Radcliffe et al., 2008). It paves the way for new learning spaces by providing appropriate design and operation. This framework helps stakeholders for better teaching learning spaces with regard to pedagogical, technological and physical dimensions. It also provides learning experiences holistically as well as objectively in the domain of pedagogy, technology and space. It deals with three elements and six polarities.

A number of studies and models centre on the relationship between pedagogy, technology, and learning environments in educational innovation processes (Radcliffe et al., 2008). Each institution's goal of facilitating student learning can be supported by well-designed learning spaces. In reality, innovative new forms of campus engagement may result from the combination of technology, pedagogy, and space (Oblinger D., 2005). Wilson and Randall (2012) focused on how teachers and students use a technologically advanced next-generation learning environment.

i) Elements of Hybrid Learning:

- **Pedagogy:** Pedagogy is emphasized on two types of learning viz, personal learning and/or collaborative learning. Personal learning is a kind of approach that combines informal learning process, learning style, technological approach, cognitive tools and assessment tools for better learning individually with new approaches or practices. Collaborative learning encourages learners to work together on a given assignment in learning process. In this learning approach students may be classified in pairs or in small groups for working together to reach the expected learning goal instead of working individually (Smith & Macgregor, 1992).
- **Space:** An innovative learning environment is called as space. The innovative learning environment may be multi-functional space or sometimes may be mono-functional space. Multi-functional space gives learners or users the possibility and freedom to decide how they want to learn through technologies. Mono-functional space or mono-functional environment is one type of space that allows realization of the complex educational activities in order to become hyper-specialized. And also, it is a space that allows learners to complete specific type of activity that gives complete realization.
- **Technology:** Technology is related to shared technology or own technology which are part of educational technology. In shared technology multiple users may use technologies simultaneously. In personal technology only one user can use technologies which may be appropriate for the user.

ii) Scenarios of Hybrid Learning:

In PST framework, there are three elements having six polarities. The combination of these six polarities generates six cases of learning contexts. These six cases of learning contexts again related with the three types of

elements at a time. However, these six cases of learning contexts are located in two types of scenarios, namely—on-site scenario and online scenario.

On-site Scenarios: On-site scenario is associated with the physical learning environment which follows four possible cases of learning environment (context), namely--

1. *Collaborative Learning with Shared Technologies in a Mono-functional Space*
2. *Collaborative Learning with Shared Technologies in a Multi-functional Space*
3. *Personal Learning with Shared Technologies in a Multi-functional Space*
4. *Personal Learning with Own Technologies in a Multi-functional Space*

1. *Collaborative Learning with Shared Technologies in a Mono-functional Space:* In this, learning space is connected to only one type of activity. This learning space follows technologies with multiple users simultaneously. This space focuses on collaborative learning only.

2. *Collaborative Learning with Shared Technologies in a Multi-functional Space:* In this space, different learning environment are connected with different activities for collaborative learning with a view to use technologies simultaneously.

3. *Personal Learning with Shared Technologies in a Multi-functional Space:* In this space, the learning spaces are having different learning activities (functions). These learning activities are characterized by different technological tools used by multiple students simultaneously for respective personal learning.

4. *Personal Learning with Own Technologies in a Multi-functional Space:* The learning spaces are connected to different activities. Each activity is carried out by each student by using own technology for his/her personal learning.

6.4 Hybrid Learning Models

1. *Flipped Model:* The original learning framework is flipped in a hybrid learning environment. This model emphasizes online learning rather to having learners attend a face-to-face training session followed by some online self-paced learning. Students read the required material on their own time, either before class or at home, and class time is used for active learning and implementing the concepts they have just learned. Case studies, group projects, or debates can be used to accomplish this.

2. *Face-to-Face Driver Model:* The face-to-face driver hybrid learning model is the most similar to conventional classroom instruction because the majority of the training is conducted there under the supervision of an instructor. This method offers personalised support to students who are having trouble understanding the new material or who are lagging behind in the training programme.

3. *Rotational Model:* According to the rotating blended learning paradigm, students must adhere to a set timetable and alternate between face-to-face interaction and self-paced online learning. Despite being rigid, the schedules are set. Utilising a variety of training techniques enables students to put their new knowledge into practise, thereby bridging any knowledge gaps. Since students are following a set timetable, this makes it simpler to monitor training progress.

4. *Flex Model:* A flexible and individualised learning experience that is especially suited to their needs is provided to learners using the flex hybrid learning paradigm. According to this paradigm, teachers give the necessary support in small-group settings while online learning takes the lead as the main means of disseminating the material throughout the entire learning process. Through the use of flexible models, students can personalise their learning journeys and timetables.

5. *Enriched Virtual Model:* With online training as its main component, the enriched virtual hybrid learning paradigm is quite similar to the flex model. In this remote work era, this paradigm has grown in popularity. Contrary

to the flex model, students are required to attend a planned instructor-led classroom session, either in real-world or online classrooms. By allowing interaction between students and instructors via online platforms, this paradigm improves the remote learning experience.

6. *The Blended MOOC*: The mixed MOOC is a type of flipped classroom that uses in-person class meetings to enhance a massive open online course. If the course is openly accessible, students may acquire MOOC materials from a different institution or teacher outside of class and then attend a class meeting for discussions or in-class activities.

7. *The Self-blend Model*: Self-blending is a model for programmers, as opposed to many of the hybrid learning models on this list that are at the course level. In this arrangement, students attend a school and also take online courses in addition to their regular in-person classes. They decide which classes they will study online and which they will take in person, and they are not under the direction of teacher.

7.0 Conclusion

Hybrid learning is suitable for learning as it has the potential to increase and extend teacher-student and student-student connectivity and builds relationships even more than in traditional or online learning. The design of an innovative learning environment should begin with the analysis of users' learning behaviours and needs. It requires focusing on the possibilities offered by technologies in supporting skills and habits that students need to learn, the kind of enrichment that they provide, and how they will demonstrate and make their affordance visible.

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