| P-ISSN: 2709-6254 | Journal of Development and Social Sciences | Oct-Dec 2023, Vol. 4, No. 4 |
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| O-ISSN:2709-6262 | https://doi.org/10.47205/jdss.2023(4-IV)05 | [53-59] |

Journal of Development and Social Sciences
www.jdss.org.pk

RESEARCH PAPER

# Challenges encountered by Secondary School Science Teachers Regarding the Implementation of Blended Learning in Punjab

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**ABSTRACT**

The objective of this research study was to explore the challenges and limitations in implementing blended learning for secondary science teachers in public schools of Punjab. The research design for this investigation was a case study. The case study was chosen to showcase a group of scientific instructors that were sensitive to challenging classroom dynamics and to look into how they interacted as a group in relation to explanations for blended learning's drawbacks. Thematic and open coding were used in the data processing. Axial coding was used to open-code all of the written and audio data. The use of BL for science instruction was not without its challenges. We invited secondary science teachers to address the problems and difficulties with BL instruction. All participants identified different challenges and issues during the teaching through BL. For example, time-consuming, videos stuck some time, electricity shortage & internet connectivity, difficult to reply during the video play, financial resources are limited for maintains, and the examination system are anti-parallels. Based on the findings of this study, it is suggested that the government raise the financial budget allocated to schools for the upkeep of digital tools and the acquisition of a new device to help teachers and students and enhance learning.

**KEYWORDS** Blended Learning, Challenges, Implication of BL, Public Schools, Science Teachers' Concern

## Introduction

Several educational methodologies, with suitable approaches, were utilized with innovation tools. Science teachers should be definite about the limitations of online, face to face and blended learning situations. They must create curriculum and design according to the need and requirements of the learners, schools, and regions (Keengwe & Kang, 2013; Shand & Farrelly, 2017). Blended learning as a method for secondary school education supports particularly research-based techniques. Several actual teaching approaches, alongside suitable approaches are also utilized with innovation and tools (Katzin, 2020).

The standard and framework of blended learning are also important to understand because science teachers must go through this process in order to advance in their careers (O'Byrne & Pytash, 2015). Participation in a blended learning program and module would be required for science teachers since, through it, they would be able to observe firsthand the viability, benefits, applications, and challenges of such informational and pedagogical tools (Baker et al., 2020).

The government of Punjab (a province of Pakistan) is introducing innovative blended learning techniques that can benefit both teachers and students throughout education as well as instruction and learning in public schools (Baber & Qaisar, 2022). In order to achieve this goal, school education departments are closely collaborating with the Punjab Information Technology Board (PITB) to develop, examine, and implement the blending of e-learning and classroom inquiry in Punjab's public schools. The Punjab Government describes its accomplishments in relation to the eLearning model utilized in schools in the eBook "Digital Punjab" (PITB, 2017, p.62). For grades six through ten, Punjab Curriculum Text Board (PCTB) textbooks have been digitalized and expanded with hundreds of multimedia systems.

## Literature Review

While blended learning (BL) as a method of instruction has the potential to expand knowledge, there are also difficulties, especially in response to the degree of involvement required for both F2F and online inactiveness (Suwono et al., 2017).

The findings of many research studies indicated that the biggest obstacles to BL application for science teachers included a lack of understanding on what BL meant, a lack of concrete BL inventiveness objectives, a lack of resources, difficulty managing time, a lack of application structures, and an incomplete and insufficient examination system (Katzin, 2020).

Today, the BL is used in institutions of higher learning, but only a small number of secondary high schools do so. The next task is to assist the secondary science teacher in their role as a BL teacher who would control the educational materials and subordinate IT as the medium of online learning (Suwono et al., 2019). increasing access to technology and knowledge for science instructors (Qureshi, Hashmi, & Baber, 2021).

Another hurdle to BL implementation is the scientific teacher's capacity and acceptability to adhere to the online timing (Baber & Qaisar, 2022). The time spent on the internet share takes place outside of face-to-face time. The science teacher might not always be available for the online section, which would interfere with the science teacher's role as a helper and assistant and would also stop the collaboration section. Due to secondary school students' frequent needs for nutrition while working hard, this becomes even more important (Katzin, 2020).

## Material and Methods

A case study was chosen as the research method for the purpose of inquiry. The case study was chosen to highlight a group of science teachers who were sensitive to stern classroom dynamics and investigate their engagement as a cluster with regard to justifications for the problems of blended learning. The case studies included an encounter within an actual, genuine circumstance or setting (DeMontmoll, 2018).

Semi-structured interviews from secondary science and field notes were included in the case study. Every participant came from a Punjab public school where the "e-learn Punjab" project was in operation.

Data were processed using open and thematic coding. Although existence is always useful, the semi-structured interview focused on comprehending a person's posture, beliefs, and attitude (Yongqi, 2016; Grimble, 2019). Organized into coding categories and then themes by axial coding, open-coded data were first generated

(DeMontmoll, 2018). All notes and recorded data were open-coded using axial coding. During open coding, significant evidence from the transcriptions or field notes that is related to the research questions may be discovered and noted in the margin (Grimble, 2019).

## Results and Discussion

Teaching through BL had significant challenges when used in science classes. The drawbacks and difficulties of teaching through BL were solicited from secondary science teachers. During the teaching using BL, every participant recognised a variety of difficulties and problems. For instance, it takes a long time, videos sometimes pause, there is a power outage and no connectivity to the internet, it is challenging to respond while a video is playing, there aren't enough funds for maintenance, and the examination system is anti-parallels. The issues that developed once the theme showed up in their responses were these.

### Time-Consuming

All of the science teachers believed that using BL facilitated them in teaching more effectively. Participants indicated that the time and space constraints associated with using a classroom as a repository make teaching through BL challenging. As SST 14 stressed, "*The current time allocation of 35 minutes per lecture has proven to be quite arduous. Considering the inclusion of student inquiries, meeting the course's intended timeline has become a daunting task*". Hence, SST 14 also recommended that "*for science subjects, we have to use animations. There is no use in seeing a four to five-minute animation. That just doesn't serve the purpose. However, if I prioritize producing more refined and comprehensive videos, it would inevitably encroach upon my lecture time and detract from addressing students' inquiries. Consequently, I propose that each lecture should span a duration of one hour - with 30 minutes devoted exclusively to the video material and the remaining half-hour allocated towards elucidating the subject matter and responding to their queries*". SST 3 also supported the above comments, "*First and foremost, would be how the students are not interested in learning. In addition, the management of time is a perennial challenge for educators. Collaboratively, we convene to deliberate and devise strategies to mitigate this issue. It follows that each individual possesses distinct difficulties and approaches in addressing such matters*". Consequently, SST8 defined, "*Thus, this is a matter that confronts us all. It necessitates an additional allocation of (complimentary) time to thoroughly review both the video and accompanying question-and-answer materials*". The researcher noted a primary concern with time inefficiency when utilizing this technique, as educators are typically unable to allocate sufficient time for student feedback within the confines of a 40-50 minute lecture period, thus rendering the benefits of BL implementation insufficient..

### Videos Stuck Sometime

Several participants emphasized the matter concerning deficient video quality, as well as the predicament of videos that failed to play during the lecture. Through SST 2 expressed his experience, "*At times, videos may become immobilized and fail to operate on a given day, thereby hindering our ability to associate relevant topics with the instructional footage and educate pupils in its absence*". As per the findings of SST 5, "*there are instances where videos and notes fail to open.*".*SST10 elucidated these matters as "The concerns comprised of the cessation of video playback"*. SST 12 explicitly stated that this matter has an adverse impact on their academic performance. *"Indeed, our academic performance is impeded when the lecture video fails to play. Consequently, we must adjust our teaching methods and testing*

*procedures based on the students' abilities. As a result, we find it necessary to reiterate certain concepts for optimal comprehension".*

**Electricity shortage and Internet Connectivity**

In the science classrooms where a teacher was teaching through BL and using an e-learn project, sometimes they faced electricity issues. In this circumstance, the majority of science teachers encountered disruptions and disturbances within their instructional spaces. As SST 15 stated, "*Sometimes, there are lighting and system problems. Videos may not work, but we still teach without them*". SST 3 has identified "*The foremost hindrance is the unstable power supply, a pervasive predicament in Pakistan that severely hinders our operations. Our latest endeavor to conduct online exams was thwarted due to an unexpected power outage. Furthermore, technological disruptions pose another obstacle that can impede progress*". SST6 defined, "*The main issue at hand is the shortage of electricity. Given that lectures are being conducted online, a transition to in-person instruction becomes necessary*". SST 1 expressed apprehension regarding the difficulty to students' learning, stating that "the primary concern we encounter is the disruption of continuous learning due to power outages."

The issue of internet availability and connectivity was also highlighted by secondary science teachers. Some participants explained that students came from poor families in public schools and they don't have internet facilities in their homes. Hence, Students cannot practice at home or watch instructional videos due to lack of personal computers. Data is shared through USB. As articulated by SST 7, "the predominant obstacles we encounter emanate from the students' end. A considerable number of pupils are devoid of personal devices such as smartphones or internet connectivity". The main necessity for this whole system when you have to teach students online is the smartphone**.** SST 2 identified, "*Smartphones cost 30-40k. It's hard for our student population, whose families rely on daily wage labor, to afford them*". SST 8 stressed, "*There exist middle-class person within the locality of our educational institution. Moreover, some individuals lack adequate means to provide their issue with portable electronic devices such as mobile phones and laptops*". SST9 added, "*maximum students do not have media if they want to do or study at home or they have no internet. We were working on LMS and our students were facing problems by opening it, then the technical team told us that they have a slow internet connection*". **S**ST14 stressed, "*there are such students in our school who do not have the facility of tab in homes. They can't revise it after going to homes*".

**Tough to respond while the video is playing**

Teaching through BL is challenging, in the opinion of the scientific instructor. In order to learn new skills and spend more time preparing for class, this strategy is necessary. All participants emphasised the difficulty in answering questions during the video that they encountered during the instructional BL. They instructed us to pause the video and respond to any student who had a question or needed help during the video lesson to avoid disturbing the other students. As SST 3 expressed, "*temporary restriction do impact our lectures. With only a limited lecture timing of 30-45 minutes per session, approximately 5 minutes are inevitably lost in initiating the class. While the application possesses commendable attributes, it is beset by one drawback: questions cannot be entertained while the video is playing*".The researcher probed a query and requested that the video be paused to allow for a response from the student. Participating in SST 3 replied like that "*Indeed, the video can be stopped at any point; however, given the weight of the course material, it is not feasible to accommodate individual student queries with frequent interruptions. Succumbing to this approach would inevitably deplete valuable lecture time. Therefore, this issue remains a challenge for all learners and necessitates additional (complimentary) time devoted to*

*comprehensively reviewing the video content and associated question-answer sessions*". SST 5 supported as, "*When presenting a video lasting half an hour, it encompasses various educational lessons. However, the time constraints prevent us from elaborating on each concept in detail after its conclusion*". SST11 stated, "*Time wastage is a significant concern when utilizing this technique, as the limited 40 to 50-minute lecture period typically precludes soliciting feedback from students and undermines the efficacy of employing BL methods*". SST 9 justified his experience, "I*t's also tricky to manage time because everything in science is systematic, and goes in a series. Each concept is related to the other, thereby producing more detailed video content. Therefore, we generally focus on only those video topics that the student is confused about*".

**Financial resources are limited for maintains**

The challenges raised by the participants was that, due to a lack of financial resources, institutions' technical infrastructure is limited, resulting in that schools do not have the latest technology and digital tool maintenance. SST 10 posited that "*the primary challenge in public schools lies in the dearth of resources and fiscal constraints".* As SST 2 supported, "*It is a formidable challenge for the government to provide tablets or computers to every citizen, given its limited resources. In contrast, the private sector enjoys ample funds from hefty fees and can easily afford such devices. However, mandating individual purchases of laptops or tablets by students in the public sector is not feasible. Those who are financially capable may opt to acquire one, while others are encouraged to consider purchasing an Android mobile device instead".* SST 15 stressed, "*An additional issue relate to the maintenance of these devices. The government does not provide support for tablet maintenance, leaving teachers responsible for repairing them out of their own salaries*". All participants shared that issue that affected their financial resources too.

**Teaching through BL and the examination system are anti-parallels**

The study revealed through interviews with secondary science teachers that all participants have concerns about time management and the exam system that are unrelated to BL. So, as opposed to the examination system, which is based on rote learning, our method is based on conceptual learning. As SST 7 stated, "*Since blended learning strategies are mostly based on conceptual learning, I believe we should not link the outcomes to them. How can we assess the outcomes when the paper's foundation is not founded on concepts? Only when we are evaluating a student's abilities and conceptions can we determine whether or not those concepts have improved*". SST 4 shared her experience, "*Unfortunately, there are no analogies between the instructional process and the examination system. While the test process continues to use strange, outmoded questions. For instance, the MCQs would be repeated, or the questions would be too strange to understand. How negligent of them to have more than a lakh pupils taking the examinations and not inform you that the question is being repeated*". SST 14 identified, "*Teachers are hesitant to utilise this application because it has nothing to do with the way I teach and our testing system. I'll be assessed based on the outcome. How many of my pupils received As or failed depends on their grades. My efforts, work, and educational methods would not have been evaluated*". SST 8 shared his views like that "*Although our board system is built on rote learning rather than conceptual learning, I use BL to nurture my students. Because of this, we cannot notice much improvement in the results, but each person's personality has been developed*". SST 1 gave the suggestion, " I *think that a certain percentage or score for blended learning should be included in the syllabus. Students won't take blended learning seriously if we don't tie it to grades*".

**Conclusion**

Using BL to teach in a science classroom wasn't without its challenges. Teachers of secondary science were questioned on the drawbacks and difficulties of BL

instruction. Each secondary science teacher identified unique difficulties and problems while utilising GI as a BL tool. For instance, it takes a long time, movies get stuck sometimes, there are issues with electricity and internet access, it's difficult to respond while a video is playing, there aren't enough resources for maintenance, and the test system doesn't allow for parallels.

These were the challenges that emerged as the theme revealed in their responses. It is difficult for pupils to practise at home, there are issues with slow internet and lighting, time management is a problem, and there are few resources available. Lack of technology resources at home, challenges with learner access and connectivity, as well as absence from class all have the potential to benefit some students more than others (Baker et al., 2020). The teaching & examination systems are antiparallel, children resort to rote learning for grades, parents can't afford gadgets, and the nation as a whole is resistant to change. The impact of technology on the education sector has caused a number of issues for Pakistani schools, including the usage of digital technologies, a lack of teaching skill, the low value of smarts books and e-learning, a lack of maintenance resources, and examinations that are unrelated to the subject matter (Bryan & Volchenkova, 2016).

The researcher believed that the findings of this case study with secondary science teachers may increase understanding of the value of BL in classroom instruction among other subject teachers and school leaders. Although the BL impairs students' ability to independently reflect creatively, teachers assist students in handling knowledge using recorded videos, internet resources, and other teacher-prepared materials.

## Recommendations

The principal limitation of the study lies in its narrow scope, as it solely encompasses four out of thirty-six districts in Punjab wherein science instructors have implemented both the e-learn Punjab project and BL pedagogical approaches. The study's restriction lies in the fact that only sixteen secondary science teachers were included, which is an insufficient representation of all Punjab Information Technology Board-trained teachers. The findings suggest a need for the government to increase financial allocation towards schools for maintaining digital tools and acquiring new devices to aid both teachers and students in enhancing their learning experience.

References

Arafah, K., Sutiawati, D. M., Sudirman, R., Arafah, B., & Arafah, A.N. (2020). *International Journal of Advanced Science and Technology, 29*(5), 13243-13252.

Baber, S., & Qaisar, S. (2022). a case study regarding challenges of blended learning practices in public school of Punjab. *Gomal University Journal of Research*, *38*(1), 56-65.

Baker, M. D., Unni, R., Kerr-Sims, S., Marquis, G. (2020). Understanding factors that influence attitude and preference for hybrid course formats. *E-Journal of Business Education & Scholarship of Teaching, 14*(1), 174-188.

Bryan, A., & Volchenkova, K.N. (2016). Blended learning: Definition, models, implications for higher education. Bulletin of the South Ural State University. Ser. *Education. Educational Sciences, 8*(2), 24–30. doi:10.14529/ped160204.

DeMontmoll, S.J. (2018). *A case study of fine arts teachers' perceptions of e-portfolio evaluation as professional development* (PhD dissertation). Concordia University, Portland.

Grimble, T. (2019). *Teacher professional development challenges for science, technology, engineering, and mathematics education*: A case study (PhD dissertation). University of Phoenix, Arizona.

Katzin, A. G. (2020). *A phenomenological study of teacher perceptions of blended learning: definition, adoption, and professional development* (PhD dissertation). Linden wood University, School of Education, St. Charles, Missouri.

O'Byrne, W. I., & Pytash, K. E. (2015). Hybrid and blended learning: Modifying pedagogy across path, pace, time, and place. *Journal of Adolescent & Adult Literacy, 59*(2), 137-140.

Punjab Information Technology Board. (2017). *Digital Punjab.* Punjab Information Technology Board

Qureshi, A. M., Hashmi, M. A., & Baber, S. (2021). Blended learning practices of science teachers in the secondary schools of Punjab. *Harf-o-Sukhan, 5*(4), 96-106.

Shand, K., & Glassett Farrelly, S. (2017). Using blended teaching to teach blended learning: Lessons learned from pre-service teachers in an instructional methods course. *Journal of Online Learning Research, 3*(1), 5-30.

Suwono, H., Susanti, S., & Lestari, U. (2017). Guided inquiry facilitated blended learning to improve metacognitive and learning outcome of high school students. *Journal of Physics, 2*(1), 1-10. doi:10.1088/1742-6596/824/1/012068.