The Impact of Blended Learning On University Education: Advancements in Technology and Learners' Performance

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Abstract

Modern technological breakthroughs have a huge influence on teaching and learning. The present study aims to address the research question, "Would using technology enhance and encourage autonomous learning while also enhancing student engagement?" A blended learning strategy was utilised in a business course to evaluate this. The mix of face-to-face and online learning sessions is referred to as "blended learning." The article reflects on the comprehensive findings of a research undertaken at the university level to analyse the influence of a blended learning effort on student involvement and overall. It also obtains students' opinions on the blended learning strategy. The survey approach was used to perform the quantitative investigation. SPSS software was used to analyse the findings. The data clearly reveal that students in the test group (where blended learning was implemented) learnt more in terms of accomplishment of learning outcomes and general engagement with online and in-class activities. The evidence supporting blended learning's good effects has been identified; it leads to improved student success and promotes student engagement. Students had a larger proportion of cognitive involvement than emotional engagement, with mean and standard deviation values of 4.13 and 1.40, respectively. Based on the findings, the study adds to the literature on blended learning by demonstrating its good outcomes. There are serious ramifications for both the teacher and the institutions who want to employ a blended learning method. As a result, serious higher education changes may be the government's future course.
Keywords: Blended Learning, Technology, Performance, Learner

Introduction

In Advances digital technology have greatly affected on teaching methods and also student learning in higher education. With the rapid changes in education, it is important to incorporate technology to make learning more effective and timely. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) has made education a key priority for society, even though there are

still challenges, especially in developing countries. According to UNESCO, having access to quality education is crucial for income equality and the spread of prosperity. Under the Education 2030 framework, UNESCO established three principles: the right to education as a basic human right, education as a public good, and the importance of gender equality and inclusion in education. Social, economic, and cultural factors can both help and hinder the education system, and these factors go beyond just technological solutions. In the United States, recent education results show that the country is falling behind other developed nations (DeSilver, 2015). At the same time, the job market in the U.S. is changing, requiring workers to be more skilled and tech-savvy. Business leaders emphasize the need for 21st-century skills, especially in technology, to improve student test scores (Rotherham & Willingham, 2009). Blended learning is one way that teachers are addressing this need.

Blended learning also refers to using technology in the classroom, where part of the curriculum is delivered online while the teacher provides support in person (Smith, 2015). The term "blended learning" became popular around the beginning of the 21st century, combining eLearning and classroom learning. Initially, it was seen as a better alternative to traditional e-learning, which had limitations in promoting interaction and context (Masie, 2006). Graham (2006) defined it as a mix of face-to-face instruction and online learning. The impact of blended learning on student performance has been studied in various settings like higher education, adult education, and workplace training, and it is considered the "new normal" in education (Norberg, Dziuban, & Moskal, 2011). Studies show that blended learning has a positive impact on students (Larson & Sung, 2009; López-Pérez & RodríguezAriza, 2011), although questions still remain about its impact across different subjects and how it affects course evaluations.

As educators saw the benefits of this new approach, terms like distance learning, online learning, and virtual classrooms emerged. These terms describe different ways of combining online and traditional learning methods. With the increased use of information and communication technology (ICT) in education, blended learning has developed into a more effective approach. It involves redesigning courses to include both classroom and online activities, aiming to increase student engagement and provide more learning opportunities online (Garrison & Vaughan, 2008).

Research has shown that using technology in education can improve access to information and make learning experiences better (Boswell & Rozelle, 2016; Aduana & Heinrich, 2018; Lui, Geng, & Law, 2017). Blended learning has been shown to have a positive impact on students' performance, with many students preferring blended courses because they offer more flexibility and convenience (Hogarth, 2010). However, designing effective blended learning courses is complex and depends on many factors. Blended learning aligns with Rousseau's idea that teachers should not always be the center of education. He suggested that teaching should focus on doing rather than just talking, and this idea is becoming a reality today with blended learning. Rousseau's vision of teaching by doing is reflected in the blended learning approach, which aims to make students active participants in their education. The goal of this study is to explore how blended learning impacts university students' performance and to understand its

effects on their learning outcomes.

Research Objective
The objectives of the study are as following:
1.   To evaluate that how deeply technology advancement have significant impact on teaching and learning.
2.   To assess the impact of blended learning on overall engagement of student at university level.
3.   To determine whether the use of technology help and support autonomous learning and also in increasing student involvement.

Review of literature
The blended learning (BL) attitude, as imitative from existing literature involves both offline and online techniques that aim to bring up learners' learning. It incorporates six key practices: face-to-face (F2F) instruction, activities, information, resources, assessment, and feedback. Figure 3 illustrates how university students adopt BL (Blended learning) based on this approach (Ramakrisnan et al., 2012; Kaur, 2013).

According to offline, F2F mode, students and lecturers engage in old-style classroom settings, supporting those who prefer instructor/teacher-centered learning. Also this technique includes lectures, group discussions, presentations, laboratory activities, and student assessments (Koohang, 2008; Sun & Qiu, 2017). Good Instructos or teachers use a diversity of materials such as whiteboards, handouts, flash drives, and creative presentations to motivate students and deliver content effectively.

Online or digital mode refers to web-based platforms that universities use to deliver lessons, make announcements, distribute assignments, grade students, and also provide easy feedback (Arbaugh et al., 2008). It also allows students or learners to access materials such as interactive e-books, videos, YouTube content, and course notes. Students also engage in communication through virtual classrooms, chat rooms, discussion boards, and email (Baragash & Al-Samarraie, 2018). Also the online assessments, such as quizzes, provide instant feedback to improve student learning (Sun & Qiu, 2017).

BL (Blended learning) has increased traction in universities, with a growing number of institutions adopting it (Means et al., 2013). Well-designed blended learning environments enhance student learning, retention, and the quality of instruction (Allen et al., 2016; Allen & Seaman, 2015; Bernard et al., 2014; Ginder & Stearns, 2014). This approach allows students some autonomy, giving them control over time, place, access, and pace, which encourages them to take responsibility for their learning. By integrating online learning with traditional face-to-face instruction, the focus shifts from passive lectures to more engaging, meaningful learning (Mayer, 2002; Willis, 2006).

Blended learning (BL) linked a variety of pedagogy and technologies, making it tough to adopt a single model for designing successful courses. It is cleared that the Web-based resources like interactive tutorials, podcasts, video lectures, and simulations foster active learning, self-directed study, and also the deeper engagement, which contribute to holistic learning experiences (Dziuban et al.,

2004; Graham, 2009; Vaughan, 2014). Deep learning may also requires active participation (Crouch & Mazur, 2001; Hake, 1998; NRC, 2000).

It is Evidence-based practices in online learning highlight the importance of engaging students to improve their success (Allen et al., 2016; Bernard et al., 2014; Means et al., 2010, 2013; Tamin et al., 2011). BL approaches, by promoting engagement, can create more active learning environments and improve both teaching quality and student learning outcomes (Means et al., 2010, 2013). Numerous studies have found that blended learning leads to better performance compared to traditional F2F courses. For example, Neuhauser (2002) found that 96% of online students considered their course more effective than traditional F2F courses. Similarly, According to Larson and Sung (2009) observed improved student performance in blended and fully online courses compared to F2F classes.

According to Tamin et al. (2011) conducted a comprehensive review of 40 years of research to evaluate whether technology-enhanced instruction improves learning outcomes compared to traditional face-to-face (FTF) classroom teaching. They found that courses incorporating technology or blended learning were significantly more effective than those using only traditional methods. This conclusion aligns with other studies and meta-analyses (Means et al., 2013; Schmid et al., 2009, 2014; Sosa et al., 2010), which also highlighted the positive impact of technology on learning. Tamin et al. (2011) further found that the use of technology as a cognitive support tool had a more significant effect on learning compared to its use as an additional feature. Overall, their study supports the idea that technology can enhance teaching and learning.

 BL (Blended learning), which combines both technology and traditional instruction, has been shown to be more effective than FTF instruction in improving learning outcomes and student achievement, especially in STEM fields (Bernard et al., 2014; Means et al., 2013). Means et al. (2013) conducted a meta-analysis of 45 studies comparing blended learning with traditional FTF instruction. The results confirmed that blended learning generally leads to better learning outcomes than FTF-only learning. This finding is consistent with previous studies (Tamin et al., 2011; Bernard et al., 2014). According to Means et al. (2013), blended learning proved more effective for both younger and older students, across various subjects, including medicine. Moreover, undergraduate students appeared to benefit the most from blended learning. This study also associated the effectiveness of purely online learning and FTF instruction, finding that blended learning outperformed both. These positive outcomes from blended learning research suggest that greater investment in the development of blended courses would be beneficial.

Latest survey by the Babson Survey Research Group (2016) explored that academic leaders are more optimistic about the outcomes of blended learning than purely online learning. They believe that blended learning is more effective and holds greater promise for teaching and learning (Allen & Seaman, 2015).

In terms of student perceptions, Monteiro and Morrison (2014) explored how students felt before, during, and after participating in a blended learning environment. Their study used a variety of instructional methods and assessed student retention. Students were given an initial survey about their expectations of blended learning and then asked to provide feedback after the course.

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Interviews revealed that students found it easier to collaborate with others, exchange ideas, and listen to different perspectives. They reported that the experience helped them develop patience and a better understanding of others' points of view.

Nakayama, Matsuura, and Yamamoto (2016) also examined student perceptions of blended learning at the end of a course. Their study, based on student questionnaires, found that most students had a positive view of the blended learning environment. However, some students expressed concerns about the time commitment required for learning outside of class. The researchers noted that this issue of inadequate out-of-classroom learning, compared to lecturers' expectations, has been a longstanding challenge in traditional learning environments and was also observed in the blended learning course (Nakayama et al., 2016).

Methodology

This section covered data collection sources, sample of the research work, and also data analysis. This research study investigates the question, "Does blended learning support autonomous learning and increase student engagement?" and also This study was directed in a business course, *Organizational Behaviour*, taken by second-year students in a graduation program. And also this course was taught in two sections: one section was redesigned to include a blended learning approach, while the other section followed traditional teaching methods. In the blended learning section, students attended in-person lectures, which were then enhanced with various activities available on an eLearning platform. This research methodology used the blended learning approach, is referred to as the test group.

Data Collection

Data was primarily gathered from three sources: focus-group interviews, student surveys, and LMS records from different universities of Faisalabad. Additionally, data on how well students achieved the course learning outcomes were collected from both sections of the course. The research tool used was based on the work of Manwaring et al. (2017), which measured students' characteristics and their ability to use technology, as well as a study by Lin et al. (2018), which focused on factors that show student engagement. The survey was divided into three parts: the first part collected background information from the respondents, the second part measured student engagement (both emotional and cognitive), and the third part looked at student characteristics such as self-confidence, interest in the subject, and ability to use technology.

Data Analysis

SPSS version 2022 was used to analyse this reseach data. For each variable in the self-administered survey, descriptive statistics were computed. The reliability of the scale was measured using Cronbach's alpha, which was found to be 0.810, showing good internal consistency. The reliability for the subscales ranged from 0.69 to 0.81, which is considered acceptable (Nunnally, 1978). Descriptive statistics, such as the mean and standard deviation, were calculated for all the variables in the study. Additionally, focus group interviews were recorded and

transcribed. Patterns, themes, and categories were identified and organized using a method called continuous comparison and content analysis. These themes were then verified by comparing the results from the open-ended survey questions.

Results

According to the survey results, the pupils were extremely engaged when participating in online activities. Cognitive engagement was found to be more percentage among the sample of students, which was considerably greater than emotional involvement.

Forum discussions, online quizzes, chat rooms, and online assignment submissions were among the activities available on the LMS. Students' interest and involvement were piqued by this strategy since they were able to communicate with one another rather than simply taking notes.

The LMS record is valuable for tracking student involvement and time spent on activities. The LMS data reveal that there is a clear relationship between the date of assessments and the pattern of LMS usage. Students were told about blended learning throughout the first week. They were in a state of flux.

Descriptive Statistics

	N	Mean	Std. Deviation
Did you enjoy the LMS activities?	150	3.7067	1.22363
Did you feel good about yourself?	150	4.1333	1.08477
Do you like to participate in these activities on LMS	150	3.4000	1.12923
Did you experience frustration?	150	3.8200	1.08108
Did you feel socially connected to anybody during this learning activity?	150	3.7733	1.18801
Did you wish you had been doing something else?	150	3.6867	1.31147
Were these activities interesting?	150	3.7733	1.18235
I like the subject matter of this course.	150	3.8733	1.17180
I am very interested in the content area of this course.	150	3.6467	1.15936
Understanding the subject matter of this course is very important to me	150	3.4000	1.35111
How well were you concentrating?	150	3.4000	1.35111
Were you learning anything or getting better at something?	150	3.6200	1.09096

How challenging were the activities on LMS?	150	3.6400	1.18310
Online quiz	150	3.9133	1.14655
Online forum discussion	150	3.5933	1.34162
Chat discussion	150	3.5733	1.35283
Online personality test	150	3.0133	1.40463
Mid course feedback	150	3.8333	1.07701
Glossary	150	3.5533	1.27198
Mentoring session	150	4.1000	1.09759
Web pages	150	3.5467	1.20729
Group project	150	3.7867	1.25097
Valid N (listwise)	150		

Findings

This section presents the outcomes of a blended learning approach used in the different universities of Faisalabad.

The above table defines that the Mean and SD values of each statement of. "Impact of blended learning at University Level". And the greatest value in factors of mean and standard deviation is 4.133 and 1.40 blended learning impacts on students at University Level. And, the lowest Mean score and Standard deviation is 3.40 and 1.07 of blended learning impact on students at University Level.

Discussion

Previous research has shown that eLearning platforms frequently provide comparable performance to the traditional face-to-face method (Cook et. al 2008The study aimed to find out if combining eLearning with traditional face-to-face methods can increase student engagement and improve learning outcomes. The research focused on how blended learning affects student engagement (both emotional and cognitive), learner characteristics (such as self-confidence, interest in the subject, and tech skills), students' time and quality of discussions on the Learning Management System (LMS), and their views on the blended learning approach. To introduce blended learning at the test universities, the following changes were made to the traditional course:

- The course page on the LMS was redesigned to be more attractive and easier to use.
- Each class session was connected to a video or picture that was posted on the LMS a day before the regular class.
- The instructor created an online forum for students to discuss the topic online, where they could share text, video, or audio.
- To engage students, case-lets were uploaded to the LMS and given to students ahead of the next class activity.
- Online quizzes were provided for students to review and test their knowledge of the previous chapter.
- The instructor uploaded assignment guidelines to the LMS, and students submitted their work there.
- All students were required to submit their course projects online through the Turnitin assignment page.

- A special mid-course feedback session was organized on the LMS, allowing students to rate and comment on the course delivery anonymously to encourage more interaction.

Conclusions

Latest role of technology in education today, higher education needs to understand and also promote BL. This study has also helped us learn about the effects of blended learning and how integrating technology into classrooms can support independent learning and increase student engagement. Blended learning offers several benefits: it is creative, promotes active learning, allows for more personalized and student-centered experiences, and is more engaging for students. The study shows that when blended learning is well-balanced, it can lead to higher student achievement and engagement. Blended learning is not just a way to improve traditional lectures; it represents a major shift in how we teach and learn. The potential of blended learning in higher education is huge, but more research is needed to fully understand its practices and impact. To measure its effectiveness, ongoing studies of blended learning are necessary. This approach could bring significant changes to how students engage with education and could revolutionize the learning process. The study found that cognitive engagement, or thinking deeply about the material, is more important than emotional engagement in blended learning. This research also adds valuable insights to the field of blended learning. It highlights the important implications for both teachers and institutions that want to implement blended learning. The findings suggest that serious changes in education, possibly led by government policy, could be the next step. Overall, the study concluded that blended learning has a positive impact on students' performance and achievement.

Future Recommendations

Following are the recommendations for blended learning at university level:

➢ It should be properly and accurately measured.
➢ It should be researched on large scale and will be very helpful for further education improvement.
➢ It should be properly analysed or evaluated.
➢ Teachers and students should be trained before implementing blended learning technique.
➢ Limitations regarding access and technology should be accounted for.
➢ It should be launched because it is an easy way to comprehend education.

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