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Virtual and Physical Mode of Learning in Higher Education: Experiences and Reflections of Students

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Abstract

Purpose- The debate between online and physical learning has become more relevant, particularly in higher education, with the rapid adoption of digital platforms and the shift caused by the COVID-19 pandemic. This study explores students' experiences and preferences regarding online versus physical learning environments at Dharanidhar University.

Design/methodology/approach- Using a survey design, data were collected from 197 students, using quantitative (questionnaires) and qualitative (interviews) methods. The study investigates both modalities' key factors such as interaction, feedback, teaching quality, and time management. Results show a strong preference for physical classroom learning (69.81%) over online learning (19.81%), with students valuing face-to-face interaction, immediate feedback, and collaborative learning. However, online learning was appreciated for its flexibility and personalized pace.

Findings- Overall, the findings contribute to the ongoing discourse on the effectiveness of these learning modalities and provide insights into optimizing education delivery in future academic settings.

Originality- The research highlights the importance of tailored teaching methods, the role of immediate feedback in enhancing learning outcomes, and the need for effective time management strategies in both modes. The study also points to the growing significance of blended learning, which combines online and physical education approaches.

Keywords: Mode of learning, teaching quality, Learning modalities, Student feedback, Higher education.

Introduction

The debate between online and physical classroom learning has gained significant attention, especially in higher education institutions like Dharanidhar University. As education evolves, understanding these two modes' comparative benefits and challenges is crucial for academic institutions (Moorhouse, 2020). Online learning, also known as e-learning, utilizes digital platforms for instruction, allowing students to learn remotely and at their convenience, offering flexibility that is often absent in traditional educational settings (Dhawan, 2020).

In contrast, physical classroom learning involves direct face-to-face interactions between students and instructors within a classroom environment. This traditional approach allows for immediate feedback, collaborative discussions, and real-time engagement, which many argue is vital for developing communication and critical thinking skills (Mehall, 2021). Both online and physical learning have their distinct advantages and challenges, with the choice often hinging on factors such as accessibility, flexibility, cost, and the specific learning objectives of the students (Zhang *et al.,* 2022). The COVID-19 pandemic accelerated the shift toward online learning as educational institutions sought ways to maintain continuity while adhering to social distancing measures (Dhawan, 2020). Although online learning had been implemented before the pandemic, the widespread adoption during this time highlighted its strengths, including its ability to offer learning at a personalized pace and in any location. However, despite these benefits, online learning has been critiqued for its lack of real-time interaction and social engagement, which are inherent to physical classroom environments (Zhang *et al.,* 2022). On the other hand, physical classroom learning fosters an environment for dynamic discussion, collaborative learning experiences, and the immediate exchange of ideas, which are critical for holistic educational development (Mehall, 2021). However, this mode of learning can be restrictive due to its reliance on fixed schedules, and challenges related to commuting and time management are common concerns for students (Fowler, 2014).

This study aims to explore the perceptions and preferences of students and faculty at Dharanidhar University regarding these two modes of education. This research will gather data on the perceived advantages and disadvantages of online versus physical learning at the university by conducting a comprehensive survey. Survey research is a widely used method in the social sciences for collecting data on attitudes and experiences from large populations, making it an appropriate tool for this study (Fowler, 2014).

The results of this research are expected to contribute to the ongoing debate on the future of education. With the increasing popularity of blended learning—combining both online and physical methods—Dharanidhar University has already adopted various online platforms, including Coursera, edX, and Udemy, to complement traditional classroom teaching. The insights gained from this study will help refine these approaches and suggest potential improvements to enhance educational delivery at the university.

Summary of reviews

The existing literature on online learning versus physical learning presents a comprehensive view of the impact and adaptability of educational systems, particularly in the wake of the COVID-19 pandemic. Dhawan (2020) highlights online learning as a "panacea" during the crisis, emphasizing its potential to sustain education despite unprecedented disruptions. Online learning, however, raises questions regarding the effectiveness of learner interaction and engagement, as Mehall (2021) discusses the significance of purposeful interpersonal interaction in virtual settings, suggesting that it plays a critical role in online education outcomes. Meanwhile, Moorhouse (2020) reflects on the challenges faced by educational institutions forced to transition from face-to-face learning to an online format, necessitating quick adaptations to maintain teaching quality. Fowler (2014) underscores the importance of survey research methods in evaluating educational practices, providing a methodological foundation for comparing online and physical learning experiences. Additionally, Zhang *et al.,* (2022) analyse China's policy response to the pandemic, emphasizing the need for educational continuity through emergency measures, further illustrating the global implications of online learning. These studies collectively offer valuable insights for investigating the experiences of students at Dharanidhar University, helping to identify the comparative advantages and challenges of online versus physical learning. Several studies have explored the comparison between online and physical classroom learning from various perspectives. Murtagh *et al.* (2023), Ni A.Y (2022), Chu, Y. H., & Li, Y. C. et.al (2022), Wang *et al.* (2021), Barnes *et al.* (2020), B. Eun (2020), Kirtman (2009), Korde *et al.* (2021), Kumari *et al.* (2021), and Nenagh *et al.* (2021) emphasize

that students generally perceive online learning as effective, with flexibility being a key advantage. They report that many students Favor digital learning, particularly post-pandemic, with better internet connectivity correlating with improved performance. Both online and blended learning modes have been shown to enhance learning outcomes, with smaller class sizes and more comfortable environments contributing to better teaching and learning experiences. Online learning can be as effective as face-to-face learning, especially in terms of cognitive performance and student satisfaction, and perceived engagement with faculty and peers significantly impacts the effectiveness of online courses. Conversely, studies by Rohmad *et al.* (2021); Gherhes *et al.* (2021); Aker, J. C. *et al.* (2010); L. Cindy *et al.* (2020); Mather & Sarkans (2018); Ramli *et al.* (2013); and Gupta *et al.* (2021) present challenges in online learning such as reduced interaction between students and teachers, leading to isolation. They highlight that some students struggle with concentration and time management, which impairs their ability to engage effectively in distance learning. Technology self-efficacy, motivation, and engagement are critical factors for success, but the lack of personal interaction can sometimes hinder motivation. Although online learning offers flexibility and positive outcomes, these challenges must be addressed to ensure its sustainability and effectiveness.

Theoretical framework

Jean Piaget's theory emphasizes the importance of active learning and discovery, suggesting that learners construct knowledge through direct interaction with their environment. His theory highlights four stages of cognitive development: sensorimotor, preoperational, concrete operational, and formal operational, with higher education students falling into the formal operational stage. At this stage, learners are expected to think abstractly, systematically, and critically, which can be applied to both online and physical learning environments. In the context of physical learning, Piaget's theory supports the idea that hands-on learning and face-to-face interactions provide students with concrete experiences that facilitate deeper cognitive processing. Physical environments often allow for interactive and discovery-based learning activities that align with Piaget's belief in active exploration (Piaget, 1972). In contrast, online learning provides students with digital tools and resources that can also support active learning but may lack the same level of hands-on interaction. According to Piaget's constructivist view, online learning environments must be designed to allow students to actively engage, experiment, and solve problems independently to develop higher-order thinking skills.

Lev Vygotsky's sociocultural theory emphasizes the role of social interaction and cultural context in cognitive development. Vygotsky introduced the concept of the Zone of Proximal Development (ZPD), which refers to the range of tasks learners can perform with the help of more knowledgeable others, such as teachers or peers, but cannot yet do independently (Vygotsky, 1978). This concept is critical when considering online and physical learning dynamics. In physical learning environments, students are often in closer proximity to their peers and instructors, fostering immediate social interaction and collaborative learning experiences. Vygotsky's theory would suggest that this interaction enhances students' learning by allowing them to operate within their ZPD more effectively, as they can receive real-time feedback, guidance, and support from educators and peers.

However, online learning environments present unique challenges to this social interaction. While online platforms provide opportunities for collaboration through discussion forums, video conferencing, and group projects, the social cues and immediacy found in face-to-face interactions are often diminished. According to Vygotsky's theory, this may limit the effectiveness of collaborative learning in online spaces unless the design of these platforms actively encourages and facilitates meaningful interaction.

Both Piaget's and Vygotsky's theories offer valuable insights into how students experience learning in different modalities. Piaget's theory underscores the importance of active engagement in cognitive development, which can be influenced by the nature of the learning environment whether physical or online. Vygotsky's theory emphasizes the social dimension of learning, highlighting the role of interaction and collaboration in the learning process. When applying these theories to higher education, this study explores how students' cognitive development and learning experiences are shaped by the structure and affordances of online and physical learning environments.

Objectives of the study

1. To identify and evaluate approaches that can be adopted to improve face-to-face interaction in physical learning environments.
2. To explore and recommend strategies that enhance the quality of teaching and learning in both online and physical learning environments.
3. To investigate methods for providing immediate feedback on assessments that support continuous learning and improvement in both online and physical learning environments.
4. To examine and suggest techniques that enhance time management skills among educators and learners, improving efficiency and productivity in both online and physical learning modalities.

Research questions

1. What approaches can be adopted to improve face-to-face interaction and thereby foster a more effective learning experience in physical learning environments?
2. Which strategies can be used to enhance the quality of teaching and learning in both online and physical learning environments?
3. How can immediate feedback on assessments be provided to support continuous learning and improvement in both online and physical learning environments?
4. What techniques can be applied to enhance time management skills among educators and learners in both learning modalities?

Methodology of the study

The methodology for this study employed a survey design to gather data on students' attitudes, behaviours, opinions, and demographic information related to online versus physical learning in higher education. The primary data collection techniques included both questionnaires and interviews. Questionnaires were administered in various formats paper forms, online platforms, and phone calls to ensure accessibility for all respondents. Additionally, face-to-face interviews were conducted with some participants to gather more in-depth insights. The qualitative approach allowed for a comprehensive understanding of the participants' perspectives, ensuring the data collected covered a broad range of experiences and attitudes toward the two learning modalities. This study explores the correlation between learner's characteristics and performance in the e-learning environment.

Population and sample

The population for this study comprised all 4,088 students of Dharanidhar University, Keonjhar, who had experienced both online and physical classroom learning. The objective of the survey was to explore students' preferences, experiences, and perceived effectiveness of online learning compared to physical classroom learning. The insights gained from this comparison are expected to provide valuable information for educators, policymakers, and educational technology developers. The sample for the data collection included 197 students, representing a diverse cross-section of departments, ensuring that the findings reflect a broad spectrum of student experiences and opinions regarding the two learning modalities.

Tools of the research

A structured questionnaire-based online survey (Google form) was administered to assess students' experiences in online versus physical learning in higher education. The email survey targeted 106 undergraduate and postgraduate students from various departments, including Computer Science, MBA, B.Ed., Economics, History, and Zoology. Respondents completed the questionnaire by providing their answers directly within the form. This method allowed for efficient data collection and comparison of learning effectiveness between online and physical classrooms. The structured format ensured consistent responses for statistical

Statistical technique for data analysis

In the survey titled "Virtual and Physical Mode of Learning in Higher Education: The Experiences and Reflections of Students'" data from 106 respondents was analysed using descriptive statistics and percentages to provide a comprehensive understanding of student preferences. Out of the total population of 4088, a sample of 197 was taken, with a response rate of 53.8%. The respondents comprised 50 (47.17%) online learners and 56 (52.83%) traditional learners. To analyse the data, frequency distribution was employed to summarize the responses. For instance, 21 (19.81%) students found online learning suitable, while 74 (69.81%) preferred physical classroom learning. A minority of 11 (10.38%) believed both modes of learning were equally effective. These proportions were calculated and visualized using pie charts and bar graphs to compare online and traditional learning preferences. Further, cross-tabulation was used to analyse the relationship between student's department and their learning preferences. The sample included students from Computer Science (28), Economics (25), MBA (59), History (29), Zoology (18), and B.Ed. (38). This method helped to explore any patterns in learning preferences across different fields of study.

Findings

Objective – 1: "To identify and evaluate approaches that can be adopted to improve face-to-face interaction in physical learning environments."

The researcher addressed the first major objective, "To identify and evaluate approaches that can be adopted to improve face-to-face interaction in physical learning environments." The findings highlighted several key factors linked to effective interpersonal connections, such as rapport and trust, which were significantly correlated with improved engagement (Tudge, J. & Rogoff, B.,1989 & 1992). Clearer communication was found to reduce misinterpretation, a benefit likely due to the increased understanding of non-verbal cues, suggesting the importance of emotional intelligence in these interactions (Goleman, D.,1995). The study also noted that heightened engagement and participation among learners contributed to stronger collaboration and teamwork (Vygotsky, L. S., 1978). Enhanced interpersonal dynamics in the physical learning environment, therefore, appear to support a more cohesive and interactive experience (Pianta, R. C., Hamre, B. K., & Allen, J. P., 2012).

Objective – 2: "To explore and recommend strategies that enhance the quality of teaching and learning in both online and physical learning environments"

The researcher, addressing the second major objective "To explore and recommend strategies that enhance the quality of teaching and learning in both online and physical learning environments" and found that, tailoring educational experiences to meet individual student's needs, preferences, and learning styles significantly enhances engagement, comprehension, and retention. Furthermore, integrating technology in education offers considerable potential by enabling personalized learning, allowing educators to monitor student progress and effectively provide targeted interventions when necessary. Creating a supportive and collaborative learning environment where students are encouraged to explore, experiment, and learn from their mistakes is critical for improving the overall quality of teaching and learning.

Objective – 3: "To investigate methods for providing immediate feedback on assessments that support continuous learning and improvement in both online and physical learning environments."

The research focused on the third major objective: "To investigate methods for providing immediate feedback on assessments that support continuous learning and improvement in both online and physical learning environments." The findings revealed a significant positive impact of immediate feedback on learning outcomes. Consistent with existing studies, it was found that timely feedback enhances retention, understanding, and motivation. It enables students to identify their strengths and areas for improvement quickly, promotes active learning, and nurtures a growth mindset. Additionally, integrating technology to deliver instant feedback further amplifies its effectiveness by offering personalized and timely responses tailored to individual student needs.

Objective – 4: "To examine and suggest techniques that enhance time management skills among educators and learners, improving efficiency and productivity in both online and physical learning modalities"

The researcher investigated with a major objective "To examine and suggest techniques that enhance time management skills among educators and learners, improving efficiency and productivity in both online and physical learning modalities" and found that personalized strategies and tools significantly improve efficiency and productivity. Tailoring time management techniques to individual preferences, such as prioritization methods and scheduling systems, yielded better outcomes. Furthermore, fostering self-awareness and discipline through regular self-assessment and reflection supported ongoing improvement. Integrating technology tools, such as calendar apps and task organizers, also enhanced organization and efficiency. Overall, the combination of personalized approaches, self-discipline, and technology is key to mastering time management skills.

Discussion

$RQ_{1:}$ "What approaches can be adopted to improve face-to-face interaction and thereby foster a more effective learning experience in physical learning environments?"

The researcher investigated the first research question, $RQ_{1:}$ "What approaches can be adopted to improve face-to-face interaction and thereby foster a more effective learning experience in physical learning environments?" Findings revealed that improved rapport and trust led to deeper interpersonal connections, while clearer communication reduced instances of misinterpretation. Enhanced emotional intelligence was also observed through a better understanding of non-verbal cues, supporting findings by Nenagh *et al.* (2021); and Mather & Sarkans (2018), who advocated similar benefits of interpersonal dynamics in physical learning settings. This study further compared the effectiveness of online and face-to-face learning, particularly among dental students, and found that while online learning was perceived as more effective, both methods showed comparable levels of cognitive performance and student satisfaction. However, differences in performance perception, challenges faced, satisfaction, and achievements were noted based on the mode of delivery. These findings contrast with Wang *et al.* (2021) and the Ozili, P.K (2021), who found that students tended to view the learning effectiveness of online classes as superior to that of physical classroom learning.

RQ_2: "Which strategies can be used to enhance the quality of teaching and learning in both online and physical learning environments?"

The researcher addressed the second research question, RQ_2: "Which strategies can be used to enhance the quality of teaching and learning in both online and physical learning environments?" The findings suggest that tailoring educational experiences to individual students' needs, preferences, and learning styles can significantly improve engagement, comprehension, and retention. Additionally, integrating technology into education has shown promise in enabling personalized learning experiences, allowing teachers to monitor student progress more effectively and deliver targeted interventions as needed (Van Schoors, R., *et al (2021)*; Chu *et al.*, 2022; Kumari et al., 2021; Chen, X., *et al.*, 2016).

These studies support the notion that online instruction can be particularly suitable for certain students, fostering independent learning and enhancing specific learning outcomes. They also examine the effects of online learning on physical activity and psychological distress, particularly among students and young adults. Effective technology management is highlighted as essential for enhancing the quality of online classes, with recommendations for further research on its influence on academic achievement (Chu *et al.*, 2022). However, some findings present opposing views. Ramli *et al.* (2013) and Kirtman (2009) express concerns regarding the suitability of online learning for all students, particularly concerning potential impacts on learning outcomes, physical health, and mental well-being. They underscore the importance of considering the diverse needs of learners, as well as the risk that an emphasis on technological solutions may inadvertently exacerbate existing disparities in resource access. Addressing teaching methodologies and fostering online learning communities may help educators better tailor learning experiences to contemporary learners' diverse needs.

RQ_3: “How can immediate feedback on assessments be provided to support continuous learning and improvement in both online and physical learning environments?”

The researcher investigated the third research question, RQ_3: “How can immediate feedback on assessments be provided to support continuous learning and improvement in both online and physical learning environments?” and found a significant positive impact on learning outcomes. Studies consistently show that providing immediate feedback after tests improves retention, understanding, and motivation by helping students quickly identify strengths and weaknesses,

encouraging active learning, and fostering a growth mindset. These studies highlight that while online learning offers flexibility, it often results in reduced interaction, potentially leading to feelings of isolation for both teachers and learners. Nevertheless, respondents exhibit a positive attitude toward digital learning and demonstrate awareness of barriers such as lack of focus and motivation, which underscores the need for effective strategies in distance learning. Additionally, in the field of electronics engineering, students view e-learning as a flexible and effective tool for enhancing their learning experiences. However, concerns remain about the ability of e-learning to adequately address complex technical concepts and provide hands-on experiences typically available in physical classrooms (Kumari *et al.*, 2021; Oliver *et al.*, 2017). While e-learning presents clear advantages, these findings suggest the importance of carefully considering its limitations to ensure comprehensive learning outcomes.

RQ_4: "What techniques can be applied to enhance time management skills among educators and learners in both learning modalities?"

The researcher investigated the fourth research question: RQ_4: "What techniques can be applied to enhance time management skills among educators and learners in both learning modalities?" Findings revealed the effectiveness of personalized strategies and tools, indicating that tailoring techniques to individual preferences and needs such as prioritization methods and scheduling techniques leads to better outcomes (Gherhes *et al.*, 2021; Barnes *et al.*, 2020). These studies also emphasized the importance of understanding students' perspectives on e-learning to adapt to the evolving educational landscape and address unique challenges, thus ensuring its long-term viability. The research demonstrated a positive correlation between online course exposure and students' perceptions of e-learning, suggesting that greater familiarity promotes a more favourable outlook. However, other studies present contrasting viewpoints. According to Aker, J.C et.al (2010), while incorporating student feedback is beneficial, it may not fully address systemic issues or broader educational inequalities. Additionally, expanding online learning options could exacerbate existing disparities in access to resources and digital infrastructure, thereby widening the gap between students with and without adequate technological support. Thus, while e-learning has its advantages, it is crucial to approach its implementation carefully, ensuring equitable access and support for all learners.

Further study

1. The researcher suggested that the future researcher may emphasize on comprehensive analysis of physical classroom and learning dynamics from different angles or through the triangulation method, especially for Dharanidhar University, so that the University should prioritize fostering dynamic interactions between teachers and students, as highlighted by the significant preferences by the student respondents as a better engagement method.

2. The researcher suggested that future researchers in education should focus on implementing and evaluating strategies aimed at fostering dialogue, feedback, and clarification within the classroom environment. This could involve studying the effectiveness of various techniques, such as peer-led discussions, teacher facilitation methods, and technology-mediated communication tools, in promoting active engagement and deeper understanding among students. Furthermore, there is a need to explore how universities can better support collaborative learning environments through the organization of small group activities, seminars, and other interactive sessions.

3. The researcher suggested that future researchers should explore strategies for minimizing distractions and disruptions in the classroom environment to enhance the learning experience. This could involve investigating the impact of various interventions, policies, and technologies aimed at addressing common sources of distraction, such as mobile phone use, side conversations, and other external disturbances.

4. The researcher suggested that, for future researchers comparing online and physical classroom learning, it's recommended to employ a multifaceted approach that considers various dimensions of the learning experience. Quantitative analysis should include comparing academic performance metrics such as grades, test scores, and retention rates between online and physical classroom settings. However, the effectiveness of online learning can vary depending on factors like course design, instructor skills, and student characteristics. Therefore, qualitative methods such as surveys, interviews, and focus groups can provide valuable insights into student satisfaction, engagement, and perceptions of learning outcomes in both modalities.

5. The researcher suggested that future research could explore the effectiveness of tailored instructional design, given the diverse preferences observed among learners regarding engagement methods (such as individual assignments, group w animations, etc.). This could involve developing adaptive learning platforms that personalize content delivery based on individual preferences and learning styles.

Conclusion

The study underscores the dynamic nature of e-learning and its profound impact on educational processes. Recognizing students' perspectives is pivotal in navigating this evolving landscape and ensuring the long-term sustainability of online education. While familiarity with online courses positively influences perceptions, it is essential to remain mindful of diverse viewpoints and potential biases. Integrating student feedback is key to enhancing educational experiences, alongside efforts to broaden online learning opportunities and address digital disparities. The study highlights the complex nature of education and the importance of understanding diverse learner perspectives. It identifies strategies for improving engagement and learning outcomes in physical and online classrooms while also acknowledging limitations such as sampling biases. Addressing these recommendations can lead to advancements in educational practices and better student experiences.

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