

A COMPARATIVE STUDY ON ONLINE, OFFLINE AND BLENDED LEARNING METHODS: ENHANCING EDUCATIONAL EFFECTIVENESS IN THE DIGITAL AGE

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Abstract-The education sector is witnessing a paradigm shift with rapid and ongoing technological advancements. The online, offline, and blended modes of learning continue to evolve with time. The purpose of this survey is to collect students' responses to understand their perspectives on the different modes of learning. The advantages, challenges, and requirements for conducting classes through online, offline, and blended learning methods are discussed. A questionnaire was designed, and a survey was conducted among undergraduate and graduate students. The questions are carefully planned to understand the choice of students while selecting different modes of learning, various activities and tools, and the reasons for their preferences. 200 students took part in the survey and shared their feedback. The advantages and disadvantages of online and offline learning are presented. A chi-square test was conducted, and the association between the two questions is shown to be significant. Suggestions for enhancing teaching and learning based on the findings of the survey help faculty members to plan the teaching methodology to suit the requirements of students.

Keywords: Blended Learning, Educational, Online, Offline, Digital Age.

1. INTRODUCTION

Learning is a dynamic phenomenon and it is evolved continually over the years. The effectiveness of learning depends on the methodology adopted. The methodology or the pedagogy depends on the skillsets that are expected to be acquired by the students. The COVID-19 pandemic has given an opportunity to experience and assess various online teaching and evaluation tools. In this the stake holders are students, teachers and institutional administrators. Chang et al. [1] had contrasted the physical classroom learning efficacy and online learning to estimate and enhance the quality of learning. Both the methods of learning were surveyed among the students, and results showed that the learning efficacy of online class learning was better than that of physical classroom learning. Survey results on the contrary indicated that the suitability and fairness of physical classroom evaluation were better than that of online examination. The students across various schools expressed their learning experiences during the COVID-19 pandemic period were to some extent effective and engaging. The study by Singh et al. emphasized the thrust to build an apt infrastructure and capacity building to support hybrid and blended learning methods. The capacity building also included familiarizing the faculty members with the various online learning methods and e-Learning tools. The study by Singh et al. suggested that both the learners and the teachers are to make use of the innovative technology to enable effective teaching and engaged learning [2]. Ghosh [3] presented an intelligent tutoring system (ITS) that behaves like a real teacher by having the dynamic response and dynamic review of the performance of students and their level of understanding. In the backdrop of COVID-19 and its multiple variants, the challenge was to design appropriate educational technologies to improve learning efficiency [4, 5]. Darius et al. [6] found that animations, digital collaborations with fellow students, video lectures delivered by the same faculty, online quizzes, student version software, online interaction with faculty, and online materials provided by the faculty promote effective online learning.

A study conducted by Michalíková and Povinský, Matej Bel University concluded that blended learning was one of the best ways of learning during this pandemic period [7]. The conclusions of a study conducted by Hysaj in Albania motivate the researchers to bring out more research on the employment of various technological tools to raise young learners' lively involvement in online learning [8]. Online learning tools provided a good learning space for learners to learn independently. Also, the proposed teaching model would enhance the students' knowledge retention in comparison to traditional classroom learning. Hence, the proposed model proved to be feasible and effective although it requires necessary capacity-building measures in place, as shown in Fig. 1 [9,10,11]. In all the e-learning, hybrid learning, and blended learning strategies, interactions between students and teachers are vital apart from the appropriate online settings. Nortvig et al. indicated that the designed influences between online and offline activities as well as between campus-related and practice-related activities are crucial factors for effective learning.

2. EMPLOYING BLENDED LEARNING IN THE LEARNING ENVIRONMENT

This paper reports the outcome of a survey carried out among undergraduate students. The responses given by students are presented and discussed in the following sections. The comments and suggestions given in the last section are useful to faculty members in designing their teaching pedagogy to suit the requirements of students to improve the quality of teaching-learning.

2. METHODOLOGY

The parametric study was carried out to understand the advantages and disadvantages of the different modes of learning such as Online, Offline, and Blended. A questionnaire as shown in annexe-1 was developed by the authors, and it was used for conducting the survey. Questions 1–8 are used to know the student’s familiarity and inclination to use the different modes of learning. Questions 9–10 are related to knowing the various activities and tools, used by the students. Questions 11–14 are for knowing the reasons as to why students prefer one mode of learning to the other. The last section of the questionnaire is for the comments and suggestions by the students for improving the teaching and learning methods followed at present. The questionnaire was floated in the form of Google form and a total of 200 students from various universities participated in this survey. The data analysis was done using Microsoft Excel and Chi-square method is used for checking the association between different questions. 66% of the respondents are from the Science stream, 30% of them are from commerce, and the rest are from other Arts streams. Students of the age group from 16 to 30 years took part in the survey. 54% are from the age group of 16–20, 45% are in the age group of 21–25 and only 1% are in the age group of 26–30. 83.9% of respondents are males, and 16.1% of respondents are females.

2.1 Preferred Mode of Learning in Adverse Situations

During adverse situations, the majority of students still prefer attending offline lectures at the university, despite the challenges of commuting. Fig. 2 shows that 48% of students prefer offline lectures, 46% favor online lectures, and 6% remain indecisive. Offline classes offer opportunities for socializing with peers, interacting with teachers, and stimulating class interactions. Face-to-face discussions and a well-organized classroom enhance higher-order thinking, contributing to research projects and class assignments (Paul and Jefferson [13]; Kemp and Grieve [14]).

2.2 Integration of Technology in Learning

Since the pandemic, students have shown a noticeable inclination toward integrating technology in learning. Table 1 indicates that 39% of students agree that technology-driven learning is more user-friendly, with 16% strongly agreeing, 26% remaining neutral, 13% disagreeing, and 6% strongly disagreeing. Digital learning is multifaceted, and understanding e-Learning is crucial for reaping its maximum benefits. Incorporating technology in teaching pedagogies enriches the learning experience, equipping both teachers and learners to face multiple challenges (Mayadas et al. [15]).

2.3 Facilitating Individualized Learning in Miscellaneous Modes

Miscellaneous modes of learning offer opportunities for facilitators to identify learners' needs and improve teaching pedagogies. Table 1 shows that 50% of students agree that a multidimensional learning environment facilitates individualized learning by addressing difficulties faced by learners with mixed ability levels. The responses are distributed among strong agreement (26%), neutral (17%), disagreement (5%), and strong disagreement (2%). Flexible pedagogies accommodate diverse learners, enhancing learning satisfaction and addressing psychosocial needs (Freitas et al. [16]; Rahman et al. [17]).

2.4 Enhanced Learning through Various Modes

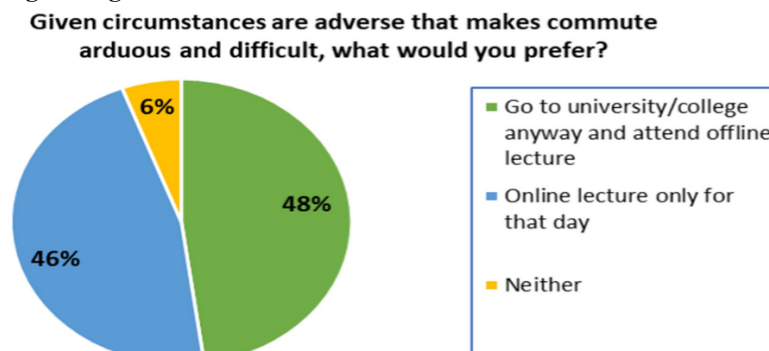


Fig. 2.1 Different Modes of Learning

Different modes of learning have led to the development of innovative teaching methodologies and tools. Fig. 2.1 reveals that 48% of students prefer classroom learning with notes and materials shared through ICT tools, while 46% prefer chalk and board with ICT tools, and only 6% prefer the traditional chalk and board method. Technology-enhanced education with face-to-face interactions and digital tools fosters engagement, competency-based learning, and an improved teaching-learning experience (Kirkwood and Price [18]; Watson [19]).

2.5 Various Tools to Enable Learning

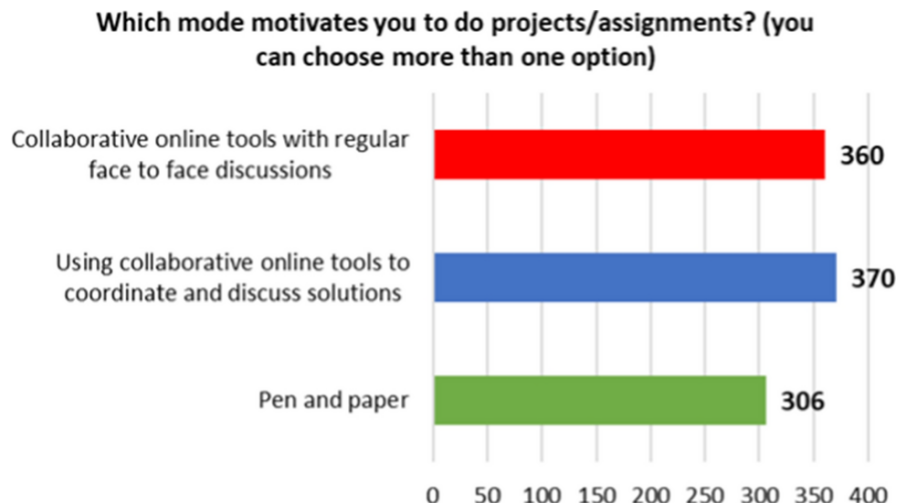


Fig. 2.2 Various Tools in different Learning Modes

Availability of various tools in different learning modes benefits students. Fig. 2.2 shows that students explore different options for completing assignments and projects, with 370 students preferring online collaborating tools, 360 using collaborative tools with face-to-face discussions, and 306 preferring pen and paper. Combining online tools with offline activities enhances efficiency and understanding, while reducing lecture time and promoting critical thinking and problem-solving skills (Mathera and Sarkan [27]).

2.6 Teacher-Student-Peer Communication

Communication plays a vital role in education, and fig. 2.3 highlights that students strongly prefer offline modes to interact with peers and teachers (58%). Face-to-face meetings and interactions create engaging discussions and expand the thinking arena. Offline classes support interaction, self-esteem, confidence, and motivate students to become active members of the learning community (Kee [20]; Roval and Jordan [28]).

2.7 Conducive Set-Up of Laboratory Activities

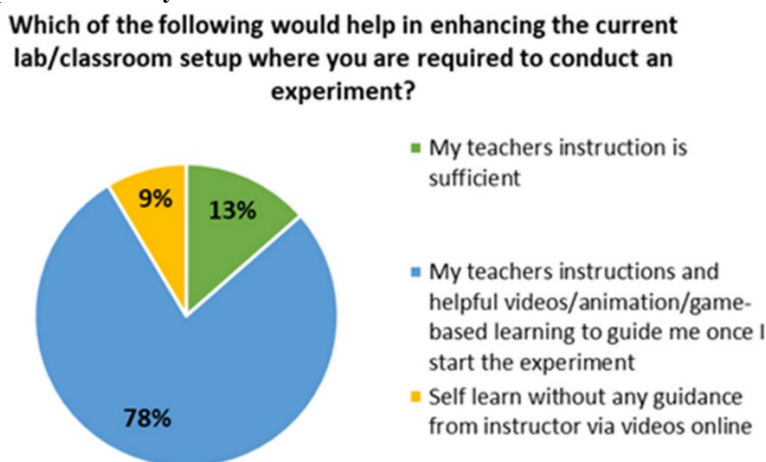


Fig. 2.3 What Plays a Crucial role in Learning and concept Building

Laboratories play a crucial role in learning and concept building. Fig. 2.3 shows that 78% of students feel that teacher instructions and aids like videos and animations enhance the laboratory setup. Laboratories offer practical utility to understand theoretical concepts, stimulate research temperament, and enhance technical proficiency.

2.8 Peer Learning

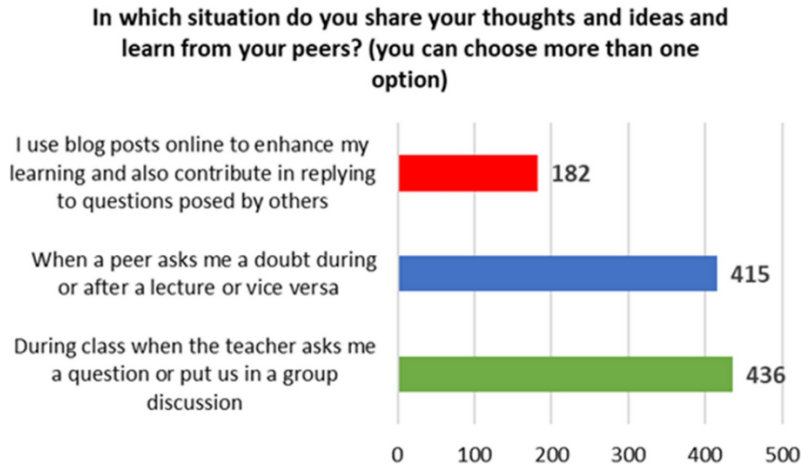


Fig. 2.4 Students Preference of sharing thoughts and Ideas

Peer learning strengthens theoretical and interpersonal skills. Fig. 2.4 indicates that students prefer sharing thoughts during class discussions, answering questions asked by peers, and using online blog posts to enhance learning. Peer learning inculcates managerial skills, promotes team-building exercises, and encourages critical evaluation of peers' work (Boud et al. [23]; Topping et al. [24]).

2.9 Online Methods to Enhance Offline Classes

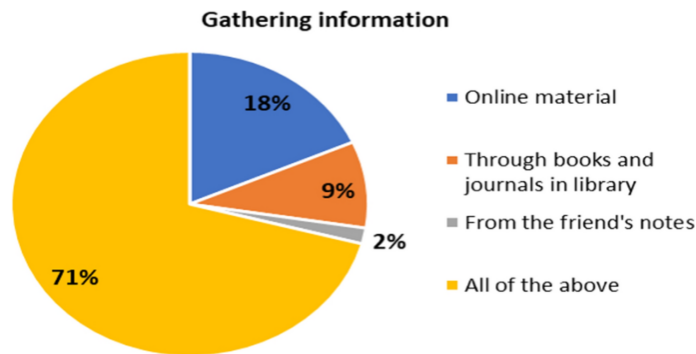


Fig. 2.5 Methods of gathering Information

Online tools and methods can enhance the learning experience in offline classes. Fig. 6 shows that students find laboratory simulations, animated graphics, pre-recorded videos, AI-powered tools, and flipped classrooms interesting additions to offline learning. Integrating technology in offline classes can create a lively and engaging learning environment.

3. REASONS FOR LIKING ONLINE AND OFFLINE CLASSES

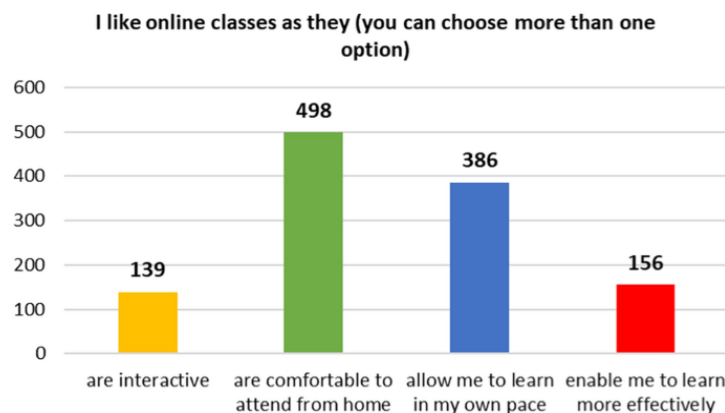


Fig. 3.1 Reason for preferring online and offline Classes

Both online and offline modes have their advantages and disadvantages. Fig. 3.1 presents various reasons why students like online classes, such as comfort, flexibility, and effectiveness.

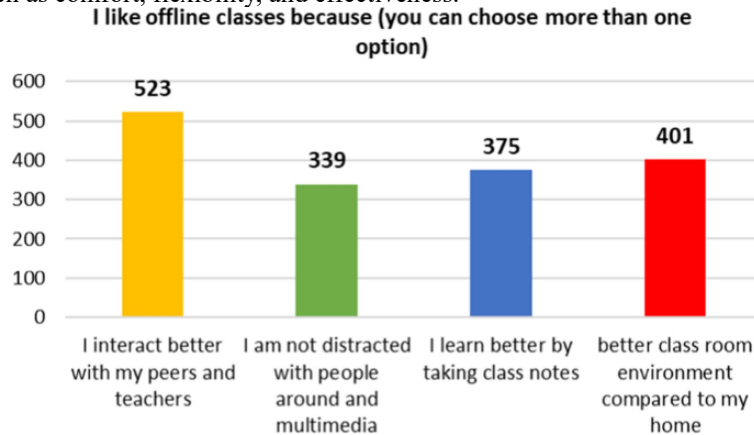


Fig. 3.2 Reason for preferring online and offline Classes

Fig. 3.2 shows that students prefer offline classes for face-to-face interactions, better classroom ambiance, and reduced distractions. Students appreciate the advantages of both modes and recognize that each has its unique benefits (Wladis et al. [25]; Bandara and Wijekularathna [26]).

4. CHI-SQUARE STATISTIC

A chi-square test confirms a significant association between responses to questions 3 and 7, which focus on different modes and tools available for learning. The preferred mode chosen for one question aligns with the choice for another. Both online and offline modes, when combined effectively, can enhance the learning experience.

5. COMMENTS AND SUGGESTIONS

Students provided various comments and suggestions, expressing their strong preference for attending offline classes due to saturation with online learning. They highlighted the importance of peer interaction, engaging activities, and access to teaching material for effective learning. Some suggested the integration of technology in offline classes to make them more interesting and interactive. Faculty training in online teaching and the ease of use of online tools were also mentioned to improve the learning experience (Mathera and Sarkan [27]; Kee [20]).

CONCLUSION

Learning in any mode is dependent on the learner's thirst for knowledge and the skill of the instructor to impart that knowledge and the competency of both the learner and the instructor. During this pandemic, several online tools enhanced the teaching-learning process. The value the student-teacher-peer interactions during offline classes was felt by everyone. In light of the present circumstances, the following conclusions are found to improve the current teaching-learning process based on the survey results and comments from the respondents. Off-line classes are preferred over online classes since student-teacher-peer interactions are better.

Classroom learning plus reading materials, PPTs, and videos shared by the subject teachers to students help students to learn beyond the classroom.

Collaborative online tools in addition to face-to-face discussions for solving problems are preferred.

Most of the students prefer to learn from the video lectures delivered by the same teachers who handle the subjects for theory as well as for conducting laboratory experiments.

Many students prefer to share their thoughts during the interactive sessions conducted in the classrooms or in group discussions.

Online classes are preferred when off-line classes cannot be conducted; especially during situations like the pandemic online class is the best alternative to off-line classes since they help students to follow safety protocols.

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