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# Blended Learning Modality and its Challenge Towards Enhanced Teaching -Learning Policy

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**Abstract:** The study investigates that the deployment and challenges of blended learning modalities across five universities in China, focusing on the perceptions and experiences of both students and faculty members. Utilizing a descriptive comparative research design, the study incorporates quantitative methods to provide a multifaceted analysis of the implementation of blended learning. Central to the research are the demographic characteristics and academic backgrounds of the participants, which play a significant role in their engagement with blended learning environments. The analysis explores the varying impacts of blended learning across different age groups, genders, and academic disciplines, providing insights into the adaptability of this educational modality. A significant portion of the study is dedicated to understanding the specific challenges encountered in blended learning settings, including technological hurdles, resource limitations, and communication barriers. Through statistical analysis, the research identifies significant differences in the assessment of blended learning based on the demographic profiles of respondents, offering empirical evidence that supports the need for tailored educational policies. Moreover, the findings contribute to the formulation of specific policy recommendations aimed at enhancing the effectiveness and experience of blended learning. These recommendations address the identified issues, suggesting potential solutions and improvements that could make blended learning more accessible and beneficial across diverse educational contexts.

**Keywords:** Blended Learning; Obstacles in Utilizing Blended Learning Modality; Teaching -Learning Policy.

## 1. Introduction

The integration of information technology in education has catalyzed a paradigm shift in teaching and learning methodologies. The onset of the 21st century has been marked by the proliferation of digital technologies, creating novel pathways for educational delivery, one of which is blended learning. Blended learning is a systematic combination of traditional face-to-face educational interactions with technologically mediated instruction. This pedagogical approach has become increasingly popular as it promises to harness the advantages of both digital and physical teaching environments. The emergence of blended learning can be seen as a response to the growing demand for flexible, scalable, and student-centered educational practices.

The concept of blended learning is not monolithic; it encompasses a spectrum of strategies and models, each aligning various degrees of online and in-person instruction. The rationale behind its adoption is multifaceted. Blended learning aims to provide learners with the opportunity to engage with course material flexibly and at their own pace through online resources while also benefiting from the social interaction and immediate support of traditional classroom settings. As digital literacy becomes ever more critical in an interconnected world, blended learning also serves to familiarize students with using technology as a tool for knowledge acquisition and professional development.

Historically, the traditional classroom setting has been the cornerstone of educational delivery. However, with the advances in Internet technologies and digital content creation, the limitations of traditional education became more apparent. Classrooms are often restricted by physical space, access to resources, and the one-size-fits-all pace of instruction, not accounting for the diverse learning needs and styles of students. In contrast, blended learning offers a more individualized learning experience. The self-paced nature of online components allows learners to master content before moving on, while in-person components ensure that the structure and support necessary for student success are maintained.

In the context of Chinese higher education, the move towards blended learning has been particularly noteworthy. China's rapid technological development and significant Internet user base provide a fertile ground for the adoption of digital education strategies. The deployment of wireless networks across campuses and the affordability of Internet access have been critical factors in facilitating the shift towards blended learning. The COVID-19 pandemic further accelerated this trend, necessitating a sudden transition to online learning and highlighting the need for effective blended approaches (Qadriani, 2022).

The vast adoption of blended learning modalities in Chinese universities has been supported by a robust technological infrastructure. By 2023, the country has seen an extensive reach of wireless connectivity and a marked reduction in the cost of Internet access within higher education institutions. This has democratized the access to blended learning, making it a viable option for a wide range of students from various socioeconomic backgrounds. The establishment of the China Wisdom Education Public Service Platform in 2022 exemplifies the efforts to centralize and standardize educational resources, allowing for an unprecedented level of resource sharing and collaboration among educational institutions.

Despite its growing popularity and the favorable conditions for its implementation, the effectiveness of blended learning as an educational modality remains a subject of inquiry. This is especially pertinent as the Chinese higher education system

continues to grapple with the challenge of ensuring equitable educational outcomes across diverse regions and university settings. Studies suggest that blended learning can enhance learning outcomes, promote student engagement, and cater to diverse learning preferences. However, there is also an acknowledgment of the need for a more nuanced understanding of how blended learning influences academic performance and the overall student experience (Yuan, 2023).

The efficacy of blended learning is determined by a complex interplay of factors, including but not limited to technological accessibility, the quality of online content, the pedagogical competencies of educators in managing a blended environment, and the support structures available to students (Cheng, Xu, Tang, Chan, Li, & Yang, 2023). As such, the mere presence of technological infrastructure does not guarantee successful outcomes. Effective blended learning requires careful planning, design, and implementation, with a focus on aligning educational objectives with the strengths of both online and traditional teaching methods (Zhang & Fisher, 2022).

Furthermore, the question of how blended learning impacts the standards of teaching and learning is pivotal. It is not enough to adopt blended learning for its novelty; it must be critically assessed to understand how it can contribute to and enhance educational standards. There is a need for extended teaching-learning standards that consider the unique aspects of blended learning, ensuring that the quality of education is maintained and even elevated in the face of changing modalities.

As the Chinese education system and others worldwide increasingly embrace blended learning, it is imperative to conduct rigorous research to evaluate its impact. This study is situated within this global and local context, with a focus on Chinese universities as a microcosm of the broader educational landscape. It aims to delve into the effectiveness of blended learning, exploring how it can serve as a foundation for extended teaching-learning standards, which, in turn, could inform best practices and policy development within the higher education sector.

# 2. Statement of the Problem

This study evaluates the blended learning approaches in five universities in China. Additionally, it explored the challenges face by students and teachers in implementing blended learning. Specifically, this research aims to answer the following specific questions:

1. What is the profile of the student-respondents in terms of:
   1.1 sex
   1.2 age
   1.3 major
2. What is the assessment of the respondents on the conduct of blended learning in schools in terms of:
   2.1 Face-to-face Learning,
   2.2 Online Learning,
   2.3 Teachers Facilitation,
   2.4 Teachers Technical Skills,
   2.5 Assessment and Feedback,
   2.6 Time Management, and
   2.7 Students' Self-directed Skills?
3. Is there a significant difference on the assessment of Blended Learning when their profile is taken as a test factors?
4. What is the assessment of the respondents regarding the obstacles faced by students and teachers in utilizing the Blended Learning Modality in terms of:
   4.1 Technological Hurdles,
   4.2 Resource Limitations, and
   4.3 Communication Barriers?
5. Is there a significant difference in the assessment of the respondents on the obstacles in implementing blended learning when their profile is taken as a test factors?
6. Based on the result of the study, what policies and guidelines may be proposed to enhance teaching-learning-standards?

# 3. Research Hypotheses

This study tested the null hypotheses at .05 level of significant as follows:

Ho1: There is no significant difference in the assessment of students on the conduct of blended learning when their profile is taken as a test factor.

Ho2: There is no significant difference in the assessment of the student and teacher on the obstacles in implementing blended learning when their profile is taken as a test factor.

# 4. Scope And Delimitation of The Study

In this study, the focus is on assessment of students on the conduct of blended learning and the obstacles in implementing blended in F in Henan Province, China, and explored the challenges face by students and teachers during the implementation of this teaching method. The scope and limitations of the study are clearly defined to ensure the accuracy and applicability of the research findings. In this study 581 students and teachers from five universities considered, with each university treated as a subgroup.

In terms of scope, the study selected students and teachers from Pingdingshan University (5000), Henan University of Urban Construction (7000), Henan Quality Polytechnic (3000), Pingdingshan Polytechnic College (4000), and Zhengzhou Normal University (5000) as the respondents. A total of 25,000 students and over 2000 teachers are enrolled in these five universities. In this study's total enumeration sampling, 581 students and 57 teachers were randomly se40lected as participants. These schools represent the diversity and characteristics of higher education in China, and by focusing on them, the research aims to gain an in-depth understanding of the implementation of blended learning in the specific educational environment of China. This geographical focus helps us obtain more specific and targeted data.

These schools represent the diversity and characteristics of higher education in China, and by focusing on them, the research aims to gain an in-depth understanding of the implementation of blended learning in the specific educational environment of China. This geographical focus helps the researcher to obtain more specific and target data.

Regarding the assessment of blended learning, the study focuses on both the online and face-to-face teaching components of blended learning. This includes teachers' teaching methods, technical skills, students' learning experiences, assessment and feedback processes, and time management abilities. Through these assessments, the research aims to comprehensively understand the effectiveness of implementing blended learning and the challenges it poses. Additionally, different stakeholders' perspectives, including those of students and teachers,

considered to provide a more comprehensive view.

However, in terms of limitations, firstly, since the research is limited to five universities in China, its conclusions may not be applicable to other regions or countries. Differences in educational systems, cultural backgrounds, and educational policies in different regions may have varying effects on the implementation and effectiveness of blended learning. Therefore, caution exercised when extrapolating the research's findings. Secondly, the sample size and type limited and may not fully represent all types of higher education institutions in China. The specific types of universities selected may have an impact on the research results, and some differences may not have been fully considered. Moreover, the research may not have cover all potential issues in exploring the challenges face in implementing blended learning. For example, long-term sustainability issues and internal policies of higher education institutions may not have been adequately address in the study, and these factors can also influence the successful implementation of blended learning. Additionally, the study focuses on answering specific questions relate to the implementation and challenges of blended learning and does not address broader aspects of educational theory or practice. This may limit the breadth of the research in understanding the overall dynamics of the education system. Finally, the research conducted within a specific time frame, meaning that the results obtained may reflect the situation during that particular period and may not necessarily capture changes in teaching methods and technology over time. Therefore, the research results carefully interpreted and applied in a broader context.

# 5. Research Design

In this study, a descriptive comparative research design employed to gain an in-depth understanding of the perspectives and experiences of different groups (students and teachers) in the context of blended learning and to compare the differences between these groups. By utilizing this design, the aim is to uncover the effectiveness of the blended learning model and the challenges it presents.

The study selected students and teachers from five universities as participants, ensuring representation from diverse educational backgrounds and institutions to enhance the study's validity and diversity. Data collection involved the use of questionnaire to comprehensively explore various aspects of blended learning practices.

Data analysis encompassed statistical methods, including descriptive statistics and comparative analysis, to reveal differences and similarities among different groups, provided detail answers to the research questions.

The findings of the study presented through graphical representations, tables, and textual formats to effectively communicate the discovered information.

# 6. Sampling Method

This study employed stratified random sampling to ensure the representativeness and diversity of the sample. This method divides the overall population of participants into different strata or subgroups and then randomly selects participants from each subgroup to better represent the entire population.

In terms of scope, the study selected 581 students from 5 universities using stratified random sampling from five universities. Distribution of the number of samples are shown in Table 1.

**Table 1.** Distribution of the number of samples

| Name of School | Population | Sample |
|---|---|---|
| Pingdingshan University | 5000 | 120 |
| Henan University of Urban Construction | 7000 | 165 |
| Henan Quality Polytechnic | 3000 | 76 |
| Pingdingshan Polytechnic College | 4000 | 100 |
| Zhengzhou Normal University | 5000 | 120 |
| Total | 24, 000 | 581 |

# 7. RESULTS and DISCUSSIONS

This chapter presents, analyzes, and interprets the gathered data. The data are presented in the order of the research questions, summarizing the findings of the study. It also presents the conclusions drawn from the findings and the recommendations.

1.Profile of the student-Respondents

**Table 2.** presents the profile of the student respondents.

| Profile | | Frequency | Percentage |
|---|---|---|---|
| Sex | Male | 227 | 39.07% |
| | Female | 354 | 60.93% |
| Age | 18 years old & below | 28 | 4.82% |
| | 19-20 years old | 252 | 43.37% |
| | 21-22 years old | 193 | 33.22% |
| | 23 years old & above | 108 | 18.59% |
| Major | Literature and History | 163 | 28.06% |
| | Science and Engineering | 341 | 58.69% |
| | Arts and Physical education | 77 | 13.25% |
| Total | | 581 | 100% |

Table 2 shows that two hundred and twenty-seven (227) or about 39.07% of the respondents are male while three hundred and fifty-four (354) or about 60.93% are female. This indicates that majority of the student respondents are female. This signifies that the female students in college are more involved. Twenty-eight (28) or about 4.82% of the student respondents are in the age bracket of 18 years old, two hundred and fifty-two (252) or about 43.37% are 19-20 years old, one hundred and ninety-three (193) or about 33.22% are 21-22 years old and one hundred and eight (108) or about 18.59% are 23 years old and above. This reveals that most of the student respondents are with the age of 19-20 years old. These students are mostly on their freshman or sophomore years in the university. One hundred sixty-three (163) students, approximately 28.06% of the student respondents, are majoring in Humanities and Social Sciences, three hundred and forty-one (341) students, accounting for about 58.69% of the student respondents, are majoring in Science and Engineering. Additionally, seventy-seven (73) students, or around 13.25% of the student respondents, have chosen

Arts and Physical education as their major. From these figures, it can be observed that the majority of the surveyed students are from the Science and Engineering majors.

The Assessment of Blended Learning Behavior

The assessment of the respondents on the conduct of blended learning in schools in terms of Face-to-Face Learning, Online Learning, Teacher's Facilitation, Teacher's Technical Skills, Assessment and Feedback, Time Management, Students' Self-Directed Skills.

Face-To-Face Learning

Table 3 presents the assessment of the respondents on the conduct of blended learning in schools in terms of face-to-face learning.

Table 4 shows that face-to-face learning environments received high ratings, with mean scores ranging from 3.384 to 3.434. This suggests that most students perceive face-to-face teaching activities as effective for their learning. Specifically, the item "The teaching methods in face-to-face classes positively influence your learning" received the highest average score of 3.434, with a standard deviation of 0.510, indicating high agreement among students and concentrated responses.

**Table 3.** Assessment of Face-To-Face Learning

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. The teaching methods used in face-to-face classes positively impact your learning. | 3.434 | Effective | High Level |
| 2. You think that face-to-face learning environments promote effective student interaction and participation. | 3.422 | Effective | High Level |
| 3. Face-to-face classroom activities effectively stimulate your interest in learning. | 3.384 | Effective | High Level |
| 4. You find personalized guidance received in the classroom very helpful for your learning. | 3.410 | Effective | High Level |
| 5. Face-to-face learning environments provide adequate resources and support to meet your learning needs. | 3.406 | Effective | High Level |
| Overall | 3.411 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

On the other hand, the item "Face-to-face classroom activities effectively stimulate your interest in learning" received the lowest score, with an average of 3.384 and a standard deviation of 0.497. Although this score is still within an effective range, it is slightly lower compared to other items, implying that there may be room for improvement in stimulating interest in learning through teaching activities.

Overall, based on these data, student respondents seem to hold positive views on the performance of face-to-face learning in a blended learning environment. They believe that face-to-face classroom teaching methods have a positive impact on learning, facilitate student interaction and engagement, stimulate interest in learning, and provide personalized guidance as well as sufficient resources and support. However, it is worth noting the slight fluctuations in standard deviation, indicating that some respondents may have different perspectives on these issues. These data can help educational institutions improve blended learning models to better meet the needs and expectations of students.

Anwar and Isa (2022) explored the experiences of Pakistani students transitioning from face-to-face learning to online learning during the COVID-19 pandemic in their study. They found that despite the challenges of online learning, students still prefer traditional face-to-face classroom interaction (Anwar & Isa, 2022). The research by Gómez et al. (2022) emphasizes the importance of incorporating face-to-face interaction elements into mandatory blended learning programs, especially in higher education in the social sciences post-COVID-19 pandemic (Gómez, Hinojo-Lucena, Moreno-Vera, & Alonso-García, 2022).

**Table 4.** Assessment of Online Learning

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. The online learning platform is easy to access and use, and it greatly assists my learning. | 3.382 | Effective | High Level |
| 2. The learning materials and videos provided online effectively help me deepen my understanding of the course. | 3.389 | Effective | High Level |
| 3. The flexibility of online learning activities allows me to better manage my study time. | 3.361 | Effective | High Level |
| 4. Interactions and discussion boards in the online learning environment greatly boost my motivation to learn. | 3.398 | Effective | High Level |
| 5. The self-directed learning component of online courses effectively improves my self-study skills. | 3.365 | Effective | High Level |
| Overall | 3.379 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

In conclusion, face-to-face learning components are particularly important in blended learning and have a positive impact on enhancing students' motivation, engagement, and overall learning experience. These findings support the inclusion of traditional face-to-face education in the design of blended learning, recognizing its importance and effectiveness.

Online Learning

Table 4 presents the assessment of the respondents on the conduct of blended learning in schools in terms of online learning.

Table 4 shows that assessment data regarding online learning. It includes evaluations of five different dimensions of the online learning environment, including platform accessibility, effectiveness of teaching materials, flexibility of learning activities, motivation enhancement through discussion boards, and improvement of self-learning abilities. The average scores for all items range from 3.35 to 3.39, indicating that the online learning environment is rated as "effective." However, none of the items scored at the level of "very effective". The ease of use of online learning platforms (average score 3.382) and the helpfulness of teaching materials (average score 3.389) received relatively high scores, suggesting that the technological platforms and provided instructional content are effective in supporting learning. Although the flexibility of online learning activities (average score 3.361), the motivational impact of discussion boards (average score 3.398), and the improvement of self-learning abilities (average score 3.365) are also evaluated as effective, there is room for further improvement.

Overall, respondents provided " effective " ratings for various aspects of online learning. This indicates that online learning platforms are generally positively evaluated in terms of usability, quality of course content, time management for learning, opportunities for interaction, and technical support. Despite some differences in opinions, overall, respondents hold a positive attitude towards online learning. Therefore, in the application of blended learning in higher education, schools need to integrate technology with traditional educational methods to enhance student engagement and academic outcomes. The online learning environment has a positive impact on student learning, particularly in terms of flexibility and self-directed learning.

Teachers Facilitation

**Table 5.** Assessment of Teachers Facilitation

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. Teachers effectively guide learning activities in blended learning environments. | 3.387 | Effective | High Level |
| 2. Teachers can effectively integrate online and face-to-face learning content. | 3.370 | Effective | High Level |
| 3. Teachers effectively stimulate my interest and engagement in learning. | 3.360 | Effective | High Level |
| 4. Teachers' guidance in the classroom helps me better understand complex concepts. | 3.375 | Effective | High Level |
| 5. Teachers provide timely and effective responses to students' questions and needs. | 3.373 | Effective | High Level |
| Overall | 3.373 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

Table 5 presents the assessment of the respondents on the conduct of blended learning in schools in terms of teachers facilitation.

According to the data in Table 6, the average scores for all assessment items indicate that the role of teachers in promoting blended learning environments is effective, with average scores ranging from 3.360 to 3.387, suggesting that students generally perceive the guidance provided by teachers in blended learning environments to be effective. The highest score is for "Teachers effectively guide blended learning activities," with an average score of 3.387 and a standard deviation of 0.505, indicating that students are relatively satisfied with and consistent in their views on teachers' performance in this aspect. The lowest score is for "Teachers inspire my interest and participation in learning," at 3.360, with a standard deviation of 0.491. Although the score indicates effectiveness, it is slightly lower compared to other items, suggesting room for improvement in increasing student participation and interest.

Overall, respondents rated various responsibilities and roles of teachers in blended learning environments as "effective." This includes teachers' performance in guiding learning activities, adjusting teaching methods, encouraging student participation, integrating different teaching modalities, and providing timely feedback. Although there are some differences in opinions in certain aspects (as indicated by the standard deviation), overall, respondents hold a positive view of the role of teachers in facilitation. Fisher et al. (2019) point out that teacher guidance is crucial for ensuring the effectiveness of learning activities and increasing student engagement. Their research emphasizes the diversity of the teacher's role in technology integration and student interaction. Additionally, the study by Means et al. (2019) also found that teachers play a bridging role in integrating online and face-to-face learning modes, enhancing learning outcomes through effective teaching strategies and personalized feedback.

Teachers Technical Skills

Table 6 presents the assessment of the respondents on the conduct of blended learning in schools in terms of Teachers Technical Skills.

**Table 6.** Assessment of Teachers Technical Skills

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. Teachers demonstrate a high level of proficiency in using online learning platforms and tools. | 3.373 | Effective | High Level |
| 2. Teachers effectively use technology to enhance teaching. | 3.379 | Effective | High Level |
| 3. Teachers are able to quickly and effectively resolve technical issues when they arise. | 3.355 | Effective | High Level |
| 4. Teachers' use of technology for student assessment and feedback is highly effective. | 3.353 | Effective | High Level |
| 5. Teachers' use of technology enhances the interactivity and appeal of the course. | 3.372 | Effective | High Level |
| Overall | 3.366 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

Table 6 focuses on assessing the application of teachers' technological skills in blended learning environments. The table covers five different aspects, including the use of online learning platforms, the integration of technology in teaching, quick resolution of technological issues, technology use for student assessment and feedback, and technology-enhanced course interactivity and appeal. The average scores for each item range from 3.353 to 3.379, with standard deviations ranging from 0.502 to 0.513, indicating a consistent "effective" rating level, suggesting that most students perceive their teachers to perform well in using technology and effectively support the learning process. Among these, the highest score is for "Teachers' ability to use technology to enhance teaching" (average score of 3.379), with a standard deviation of 0.513, indicating slightly dispersed evaluations for this item. The lowest score appears in the ability of "Teachers to use technology for student assessment and feedback," with an average score of 3.353 and a standard deviation of 0.513, showing lower consensus among students' opinions in this area, possibly reflecting different experiences in implementation.

Overall, respondents rated teachers' technological skills as "effective." This includes teachers' proficiency in using online learning platforms, enriching course content with digital resources, providing technological guidance and support, efficiently using teaching technology tools, and enhancing course interactivity and appeal through technology. Although there are some differences in opinions in some aspects (as indicated by the standard deviation), overall, respondents hold a positive view of teachers' technological skills.

Teachers' technological skills are crucial for the success of blended and online learning environments. According to the Technological Pedagogical Content Knowledge (TPACK) framework by Koehler and Mishra (2019), teachers need to not only master content and pedagogical methods but also adeptly use technology to support learning. Additionally, research by Guo et al. (2020) shows that teachers' technological application directly impacts student learning outcomes, especially in online and blended learning environments. Although Table 7 indicates overall good performance of teachers in technology use, the lower scores in using technology for assessment and feedback suggest the need to enhance this capability.

Assessment and Feedback

Table 7 presents the assessment of the respondents on the conduct of blended learning in schools in terms of assessment and feedback.

**Table 7.** Assessment of Assessment and Feedback

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. Both online and face-to-face assessment activities are fair and aligned with learning objectives. | 3.367 | Effective | High Level |
| 2. Assessment methods in the course, such as assignments and tests, are very helpful for my learning understanding. | 3.351 | Effective | High Level |
| 3. Teachers' feedback is timely and contributes to my mastery of course content. | 3.360 | Effective | High Level |
| 4. Online and face-to-face assessment methods are complementary and effective. | 3.355 | Effective | High Level |
| 5. Teachers' feedback is specific and constructive, greatly aiding me in improving my learning methods. | 3.344 | Effective | High Level |
| Overall | 3.355 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

Table 7 shows that evaluating online and face-to-face assessment and feedback methods. From the provided data, it can be observed that the average scores for all assessment items range from 3.344 to 3.367, indicating that students generally perceive the implementation of assessment and feedback as effective. The highest score is for "Fairness and alignment with learning objectives in both online and face-to-face assessment activities," with an average score of 3.367 and a standard deviation of 0.500, indicating students' positive attitudes towards the fairness and alignment of this assessment activity with learning objectives. In contrast, the lowest score is for "Teacher feedback is specific and constructive, greatly helping me improve learning methods," with an average score of 3.344 and a standard deviation of

0.500, suggesting that while students acknowledge the helpfulness of feedback, there may be room for improvement in specificity and constructiveness.

Overall, respondents rated various aspects of course assessment and teacher feedback as "effective." This indicates that students generally hold positive attitudes towards the fairness of course assessment, the timeliness and effectiveness of teacher feedback, the complementarity of assessment methods, and the clarity of assessment criteria. Although there are some differences in opinions in some aspects (as indicated by the standard deviation), overall, respondents hold a positive evaluation of the assessment and feedback process. According to the research by Nicol and Macfarlane-Dick (2018), good feedback should be timely, specific, conducive to self-regulation, and closely related to learning objectives. The data in Table 10 demonstrate students' acceptance of current assessment methods, particularly in terms of fairness and alignment with learning objectives, but there may be a need for further enhancement in the specificity and constructiveness of feedback.

Time Management

Table 8 presents the assessment of the respondents on the conduct of blended learning in schools in terms of time management.

**Table 8.** Assessment of Time Management

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. Blended learning helps me manage my study time more effectively. | 3.356 | Effective | High Level |
| 2. The blended learning environment provides flexible scheduling for learning. | 3.365 | Effective | High Level |
| 3. I can balance the time demands of online and face-to-face learning. | 3.343 | Effective | High Level |
| 4. Time management is crucial for my learning effectiveness in blended learning. | 3.370 | Effective | High Level |
| 5. Blended learning helps me better organize my personal study schedule. | 3.356 | Effective | High Level |
| Overall | 3.358 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

Table 8 shows that the assessment of time management in blended learning environments. From the provided data, it can be observed that the average scores for all assessment items range from 3.343 to 3.370, indicating that students generally perceive blended learning modalities as helpful in managing their study time more effectively. Specifically, the highest scoring item is "Time management is crucial for my learning outcomes," with an average score of 3.370 and a standard deviation of 0.524, demonstrating a high level of recognition among students regarding the importance of time management in learning outcomes. The lowest scoring item is "I can independently manage my study pace and time without direct guidance," with an average score of 3.343 and a standard deviation of 0.527, which may indicate that students still face some challenges in completely managing their study time independently.

Effective time management is key to success in any learning environment, particularly in self-regulated blended and online learning environments. Research by Broadbent and Poon (2019) suggests that time management skills are positively correlated with students' academic performance, emphasizing the importance of nurturing these skills. The results from Table 11 indicate that students generally perceive blended learning as beneficial for improving time management skills, but the relatively lower scores in completely independently managing study time suggest the need for more resources to be invested in cultivating students' self-management skills.

Students' Self-Directed Skills

Table 9 presents the assessment of the respondents on the conduct of blended learning in schools in terms of Students' Self-Directed Skills.

**Table 9.** Assessment of Students' Self-Directed Skills

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. I can independently set learning goals and track my progress. | 3.341 | Effective | High Level |
| 2. The online learning component motivates me to participate in learning more proactively. | 3.337 | Effective | High Level |
| 3. I can independently search for and utilize resources to support my online and face-to-face learning. | 3.329 | Effective | High Level |
| 4. I can effectively manage my learning progress and time without direct guidance from teachers. | 3.325 | Effective | High Level |
| 5. I have the ability to self-assess my progress and achievements in learning. | 3.306 | Effective | High Level |
| Overall | 3.328 | Effective | High Level |

Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level

Table 9 focuses on assessing students' self-guidance skills in blended learning environments. The data for each item indicate that students' evaluations of self-guidance skills have average scores ranging from 3.306 to 3.341, with an overall assessment of "effective." Specifically, the highest scoring item is "I can independently set learning goals and track my progress," with an average score of 3.341 and a standard deviation of 0.492, indicating that students have relatively good mastery of the ability to set and track learning goals. The lowest scoring item is "I am capable of self-assessing my learning progress and achievements," with an average score of 3.306 and a standard deviation of 0.534, suggesting that students may face more challenges in self-assessment, reflecting room for improvement in self-assessment skills.

Research indicates that self-regulated learning skills are crucial for academic success (Zimmerman, 2019). These skills include goal setting, time management, self-monitoring, and self-assessment, all of which are key factors in helping students learn effectively. Additionally, research by Lynch and Dembo (2018) suggests that self-regulation strategies significantly impact learning outcomes in online learning environments. The data from Table 9 reveal the overall efficiency of students' self-guidance skills but also highlight the need for improvement in self-assessment skills.

Students' Self-Directed Skills

Table 10 presents the assessment of the respondents on the conduct of blended learning in schools in terms of Students' Self-Directed Skills.

**Table 10.** Assessment of Students' Self-Directed Skills

| Items | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| 1. I can independently set learning goals and track my progress. | 3.341 | Effective | High Level |
| 2. The online learning component motivates me to participate in learning more proactively. | 3.337 | Effective | High Level |
| 3. I can independently search for and utilize resources to support my online and face-to-face learning. | 3.329 | Effective | High Level |
| 4. I can effectively manage my learning progress and time without direct guidance from teachers. | 3.325 | Effective | High Level |
| 5. I have the ability to self-assess my progress and achievements in learning. | 3.306 | Effective | High Level |
| Overall | 3.328 | Effective | High Level |

*Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level*

Table 10 focuses on assessing students' self-guidance skills in blended learning environments. The data for each item indicate that students' evaluations of self-guidance skills have average scores ranging from 3.306 to 3.341, with an overall assessment of "effective." Specifically, the highest scoring item is "I can independently set learning goals and track my progress," with an average score of 3.341 and a standard deviation of 0.492, indicating that students have relatively good mastery of the ability to set and track learning goals. The lowest scoring item is "I am capable of self-assessing my learning progress and achievements," with an average score of 3.306 and a standard deviation of 0.534, suggesting that students may face more challenges in self-assessment, reflecting room for improvement in self-assessment skills.

Research indicates that self-regulated learning skills are crucial for academic success (Zimmerman, 2019). These skills include goal setting, time management, self-monitoring, and self-assessment, all of which are key factors in helping students learn effectively. Additionally, research by Lynch and Dembo (2018) suggests that self-regulation strategies significantly impact learning outcomes in online learning environments. The data from Table 12 reveal the overall efficiency of students' self-guidance skills but also highlight the need for improvement in self-assessment skills.

Summary of Blended Learning Behavior Assessment

Table 11 presents the summary of the assessment of the respondents on the conduct of blended learning in schools.

**Table 11.** Summary of Blended Learning Behavior Assessment

| Blended Learning Assessment | Mean | Qualitative Description | Interpretation |
|---|---|---|---|
| Face-To-Face Learning | 3.411 | Effective | High Level |
| Online Learning | 3.379 | Effective | High Level |
| Teacher's Facilitation | 3.373 | Effective | High Level |
| Teacher's Technical Skills | 3.366 | Effective | High Level |
| Assessment and Feedback | 3.355 | Effective | High Level |
| Time Management | 3.358 | Effective | High Level |
| Students' Self-Directed Skills | 3.328 | Effective | High Level |
| Overall | 3.367 | Effective | High Level |

*Legend: 3.51-4.00 Very Effective/ Very High Level; 2.51-3.50 Effective/ High Level; 1.51-2.50 Less Effective/Low Level; 1.00-1.50 Not Effective/Very Low Level*

Table 11 shows that the assessment results of different domains in blended learning environments, including face-to-face learning, online learning, teacher facilitation, teacher technological skills, assessment and feedback, time management, and student self-guidance skills. The overall mean is 3.367, with a total standard deviation of 0.506,

indicating consistent evaluation results, indicating that students generally perceive these different learning environments and teaching strategies in blended learning to be effective.

Among these, face-to-face learning has the highest rating, at 3.411, indicating that students particularly acknowledge the effectiveness of this traditional interactive method in providing instructional support. Conversely, the lowest rating is for student self-guidance skills, at 3.328, implying that there is still room for improvement in supporting students' independent learning abilities.

Overall, the analysis of Table 11 results suggests that blended learning is considered effective in multiple aspects, particularly in face-to-face learning. However, the relatively lower rating for student self-guidance skills suggests that in future course and teaching strategy designs, more consideration needs to be given to how to enhance students' self-management and autonomous learning abilities. Blended learning combines traditional face-to-face teaching with modern online learning technologies, aiming to leverage the strengths of both methods to enhance educational effectiveness. According to Graham (2019), blended learning can provide a more flexible learning approach, enhancing student motivation and engagement. Furthermore, the role transition of teachers in blended learning environments is also a key factor in successfully implementing this model; they need to possess effective teaching guidance and technological application skills (Garrison & Kanuka, 2017). The data from Table 11 reflect the widespread acceptance of various aspects by students, but also highlight the importance of further strengthening students' autonomous learning skills.

Differences on the assessment of Blended Learning when their profile is taken as a test factor

Tables 12-14 present the differences on the assessment of Blended Learning when their profile is taken as a test factors.
On Sex

Table 12 shows the differences in blended learning assessment according to the gender of the surveyed students. Blended learning assessments include face to face learning, online learning, teacher guidance, teacher technological skills, assessment and feedback, time management, and student self-guidance skills.

Table 12 shows that face-to-face learning, the average score for males is 3.47, slightly higher than females' 3.37. The t-test yielded a t-value of 2.416 and a p-value of 0.016, indicating a statistically significant difference in gender perception of face-to-face learning, with male students generally rating it higher than female students.

**Table 12.** The differences in blended learning assessment according to the gender

| Blended Learning Assessment | Means | | T-value | Sig | Interpretation | Decision on Ho |
|---|---|---|---|---|---|---|
| | Male | Female | | | | |
| Face-To-Face Learning | 3.47 | 3.37 | 2.416 | 0.016 | Significant | Rejected |
| Online Learning | 3.42 | 3.35 | 1.862 | 0.063 | Not Significant | Accepted |
| Teacher's Facilitation | 3.43 | 3.34 | 2.377 | 0.018 | Significant | Rejected |
| Teacher's Technical Skills | 3.42 | 3.33 | 2.068 | 0.039 | Significant | Rejected |
| Assessment and Feedback | 3.43 | 3.31 | 3.007 | 0.003 | Significant | Rejected |
| Time Management | 3.42 | 3.32 | 2.541 | 0.011 | Significant | Rejected |
| Students' Self-Directed Skills | 3.41 | 3.27 | 3.415 | 0.011 | Significant | Rejected |
| Over-all | 3.43 | 3.33 | 2.701 | 0.007 | Significant | Rejected |

In contrast, in online learning, males have an average score of 3.42, while females have 3.35. Despite males' slightly higher scores, the t-test result shows a t-value of 1.862 and a p-value of 0.063, indicating that gender differences in this domain are not statistically significant.

Regarding teacher guidance, males have an average score of 3.43, slightly higher than females' 3.34. The t-test yielded a t-value of 2.377 and a p-value of 0.018, indicating that males rate teacher guidance higher compared to females. In terms of teacher technological skills, males have an average score of 3.42, while females have 3.33. The t-test result shows a t-value of 2.068 and a p-value of 0.039, once again indicating higher ratings by males for teacher technological application. In the domain of assessment and feedback, males scored 3.43, while females scored 3.31. The t-test result shows a t-value of 3.007 and a p-value of 0.003, indicating significantly higher satisfaction among males with assessment and feedback compared to females. Regarding time management, males scored 3.42, while females scored 3.32. The t-test result shows a t-value of 2.541 and a p-value of 0.011, indicating higher satisfaction among males with time management. Finally, in student self-guidance skills, males scored 3.41, while females scored 3.27. The t-test result shows a t-value of 3.415 and a p-value of 0.011, indicating a significant gender difference in this domain, with males rating self-guidance skills higher.

Research suggests that gender differences may influence students' perceptions and interaction styles in educational environments. For example, some studies have found that male students may be more inclined towards technology use and face-to-face interaction (Legewie & DiPrete, 2017), which may explain why males rate higher than females in most domains in Table 12. Additionally, gender differences in course participation and feedback acceptance by male and female students have also been widely documented (Bae & DeBusk-Lane, 2019), supporting the observations in Table 12. Overall, gender may influence students' perceptions of various aspects of teaching in blended learning environments. Except for online learning, males generally rate higher than females in all other domains, reflecting potential differences in gender expectations or experiences in educational settings. These findings underscore the importance for educators to consider gender differences when designing and adjusting blended learning strategies.

On Major

Table 13 shows the differences in blended learning assessment according to the major of the surveyed students. Blended learning assessments include face to face learning, online learning, teacher guidance, teacher technological skills, assessment and feedback, time management, and student self-guidance skills.

**Table 13.** The differences in blended learning assessment according to the major

| Blended Learning Assessment | Means | | | F-value | Sig | Interpretation | Decision on Ho |
|---|---|---|---|---|---|---|---|
| | LH | SE | Arts | | | | |
| Face-To-Face Learning | 3.46 | 3.37 | 3.51 | 4.367 | 0.013 | Significant | Rejected |
| Online Learning | 3.42 | 3.35 | 3.43 | 1.811 | 0.164 | Not Significant | Accepted |
| Teacher's Facilitation | 3.41 | 3.34 | 3.43 | 1.977 | 0.139 | Not Significant | Accepted |
| Teacher's Technical Skills | 3.39 | 3.33 | 3.47 | 3.091 | 0.046 | Significant | Rejected |
| Assessment and Feedback | 3.38 | 3.32 | 3.44 | 2.426 | 0.089 | Not Significant | Accepted |
| Time Management | 3.37 | 3.33 | 3.45 | 2.202 | 0.111 | Not Significant | Accepted |
| Students' Self-Directed Skills | 3.34 | 3.30 | 3.42 | 2.143 | 0.118 | Not Significant | Accepted |
| Over-all | 3.40 | 3.33 | 3.45 | 2.805 | 0.061 | Not Significant | Accepted |

Table13 shows that face-to-face learning is an integral part of traditional teaching, and students from different disciplines have varied experiences in this aspect. Students majoring in arts express the highest satisfaction with face-to-face learning, with an average score of 3.51, which may be related to the interactive and practical nature of arts disciplines. STEM students show the lowest satisfaction, with an average score of 3.37, possibly reflecting a preference for technical and experimental operations rather than traditional classroom interactions. Students in humanities and social sciences have an average score of 3.46, indicating a relatively high evaluation of face-to-face learning. With an F value of 4.367 and a P value of 0.013, the results suggest significant statistical differences in the evaluation of face-to-face learning among different disciplines. Particularly, students majoring in arts give higher ratings compared to the other two disciplines, possibly reflecting a greater reliance of arts disciplines on face-to-face interaction.

Online learning provides students with flexibility and access to abundant resources. In this area, students majoring in arts also show high acceptance, with an average score of 3.43. Students in humanities and social sciences also exhibit high acceptance, with an average score of 3.42, indicating effective support for teaching content in these disciplines. In contrast, the average score for STEM students is 3.35, although still positive, it is relatively lower. With an F value of 1.811 and a P value of 0.164, the evaluation differences among different disciplines in online learning are not statistically significant, indicating that most students have relatively consistent experiences with online learning platforms regardless of their disciplinary backgrounds.

Teachers play a crucial role as facilitators in blended learning environments. Students majoring in arts express the highest satisfaction with teacher facilitation, with an average score of 3.43, which may be because arts disciplines rely more on direct guidance and feedback from teachers. Students in humanities and social sciences give an average score of 3.41, reflecting a high recognition of the teacher's role. The score given by STEM students is 3.34, indicating a slight inadequacy in teacher facilitation. With an F value of 1.977 and a P value of 0.139, there are no significant statistical differences in the role of teacher facilitation among different disciplines, indicating that most students are satisfied with the role of teachers in promoting learning regardless of their disciplinary backgrounds.

With the integration of technology in education, teachers' technological skills become particularly important. Students majoring in arts give the highest ratings for teachers' technological skills, with an average score of 3.47, indicating that teachers in arts disciplines perform well in technology application. The average score for students in humanities and social sciences is 3.39, while for STEM students, it is 3.33, showing a gap between expectations and actual application of teacher technological skills. With an F value of 3.091 and a P value of 0.046, there are significant differences in teacher technological skills among disciplines, with students majoring in arts giving higher ratings, possibly due to the more frequent use of technology tools and platforms in arts disciplines.

Assessment and feedback are crucial aspects of the learning process. Students majoring in arts express the highest satisfaction in this area, with an average score of 3.44, which may be related to the project-based and performance-based assessment methods in arts disciplines. Students in humanities and social sciences give a score of 3.38, while STEM students' score is 3.32, suggesting a need for further optimization of assessment and feedback mechanisms in the latter. With an F value of 2.426 and a P value of 0.089, although there are some differences in assessment and feedback, they do not reach statistical significance, indicating that most students are satisfied with the course assessment and teacher feedback methods regardless of their disciplinary backgrounds.

In terms of time management abilities, students majoring in arts perform the best, with an average score of 3.45, which may reflect the flexibility provided by arts disciplines in project and task scheduling. Students in humanities and social sciences give a score of 3.37, while STEM students' score is slightly lower at 3.33, suggesting a need for more structured support in this area. With an F value of 2.202 and a P value of 0.111, there are no significant differences in the evaluation of time management abilities among disciplines, indicating that students generally adapt well to the time management requirements in blended learning environments regardless of their disciplinary backgrounds.

Self-guided skills are key to student success in blended learning environments. Students majoring in arts express the highest confidence in this aspect, with an average score of 3.42. Students in humanities and social sciences give an average score of 3.34, while STEM students' self-rating is 3.30, the lowest among the three disciplines, indicating that STEM students may face more challenges in self-directed learning. With an F value of 2.143 and a P value of 0.118, the analysis results for self-guided skills similarly do not show significant differences, indicating that students across different disciplines generally perform evenly in self-directed learning.

In conclusion, the differences in student experiences in face-to-face learning reach statistical significance, with students majoring in arts giving the highest evaluation,

suggesting that arts students may benefit more from face-to-face interaction. There are no significant differences in the evaluation of online learning environments among different disciplines, indicating that most students hold relatively consistent views on the functionality and effectiveness of online learning platforms. The role of teachers in blended learning environments does not show significant differences among disciplines, indicating that students generally perceive teachers as performing well in promoting learning, regardless of their disciplinary backgrounds. There are significant differences in teachers' technological skills among disciplines, with students majoring in arts giving higher ratings, possibly because arts disciplines rely more on technology-supported teaching methods. There are no significant differences among disciplines in the evaluation of assessment and feedback, indicating that most students are satisfied with course assessment and teacher feedback methods. There are also no significant differences in students' evaluation of time management, indicating that time management strategies and tools have been effectively applied across different disciplines. The evaluation of self-directed learning skills also does not show significant differences among disciplines, indicating that students across different disciplines generally perform evenly in self-directed learning. The analysis results from Table 13 reveal several key areas that educators need to pay attention to when designing and implementing blended learning strategies. Particularly, in face-to-face learning and teachers' technological skills, significant differences in student experiences among different disciplines require educators to optimize and adjust learning environments for different disciplines more carefully. At the same time, the lack of significant differences in most learning domains suggests that the blended learning model is relatively mature and effective in meeting the needs of different disciplines. These insights are valuable for further enhancing teaching quality and student satisfaction.

# 8. Conclusion

Based on the findings of the study, the following conclusions were drawn:

1. Majority of the student are female, who are mostly 19-20 years old, from the Science and Engineering.

2. The assessment of blended learning in schools in terms of Face-to-face Learning, Online Learning, Teachers Facilitation, Teachers Technical Skills, Assessment and Feedback, Time Management, and Students' Self-directed Skills was Effective.

The majority of students gave positive comments on various aspects of blended learning - including face-to-face learning, online learning, teacher facilitation, technical skills, assessment and feedback, time management, and students' self-directing skills. This suggests that blended learning has the potential to improve teaching interaction and student autonomy.

3. There is no significant difference in the assessments of Blended Learning when their profile is taken as a test factors.

4. The assessment of the obstacles faced by students in utilizing the Blended Learning Modality were Effective Communication with Teachers and Interacting with Peers during Online Classes. The assessment of the main obstacles faced by teachers in utilizing the Blended Learning Modality were effective communication with students and challenges in understanding or being understood

5. There is no significant difference in the assessment of the student and teacher on the obstacles in implementing blended learning when their profile is taken as a test factor.

# 9. Recommendations

In the light of the conclusions drawn in the study, the following are recommended:

1. Enhanced Training and Support for Faculty: Universities should invest in continuous professional development programs for faculty to improve their technological and pedagogical skills specifically tailored to blended learning environments.

2. Infrastructure Improvement: To address technological challenges, institutions should enhance their IT infrastructure, ensuring reliable and fast internet access and providing students and faculty with the necessary tools and resources.

3. Personalization of Learning: Implement adaptive learning technologies that can adjust the learning content and pace according to individual student needs, which can help accommodate the diverse learning styles and abilities of students.

4. Policy Development: Develop and implement clear policies that guide the adoption and evaluation of blended learning practices. These policies should include standards for course design, delivery, and assessment to ensure quality and consistency.

5. Feedback Mechanisms: Establish effective feedback mechanisms to regularly gather insights from both students and faculty about their experiences with blended learning. Use this feedback to continuously improve the learning environment.

6.Research and Continuous Improvement: Encourage ongoing research on blended learning to explore its impact further and discover new strategies for enhancing its effectiveness. Such research can provide data-driven insights that guide future enhancements.

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