Journal of Science and Technological Education, Vol. 3 No. 2, 2024
ISSN: 2830-5043 (Print) 2830-4829 (Online)

Journal of Science and Technological Education
(META)

journal homepage: www.meta.amiin.or.id

Article history: Received December 7, 2024; Accepted December 25, 2024; Published December 26, 2024

Exploring Student Preferences for Online, Offline, and Hybrid Learning Systems in Higher Education

Arisyah Dwi Fadhilah
Department of Chemistry, Universitas Negeri Medan, Indonesia
Correspondence author, arisyahdwifadhilah@gmail.com

Rabiah Afifah Daulay
Department of Chemistry, Universitas Negeri Medan, Indonesia

Rini Selly
Department of Chemistry, Universitas Negeri Medan, Indonesia

Elyana Yulinda Pakpahan
Department of Chemistry, Universitas Negeri Medan, Indonesia

Tri Retno Kusuma Wardani
Department of Chemistry, Universitas Negeri Medan, Indonesia

Abstract In the context of higher education, the digital era and advancements in technology have revolutionized learning systems, necessitating an understanding of student preferences for online, offline, and hybrid methods. This study aims to investigate these preferences and the associated reasons behind them. Data were collected through a Google Form survey administered to 110 students of chemistry department, chemistry education study program, Universitas Negeri Medan, complemented by semi-structured interviews with a subset of participants. Results reveal that 9.1% of students prefer online learning due to its flexibility and cost-effectiveness, 55.5% favor offline (face-to-face) learning for its effectiveness in understanding material and fostering interaction, and 35.5% opt for a combination of both methods, which is perceived as the optimal balance. The findings underscore the importance of adapting learning methods to enhance educational effectiveness, addressing challenges such as internet access, device limitations, and transportation costs.

Keywords: Student learning systems preferences, Online learning, Offline learning, Hybrid learning, Higher education

INTRODUCTION

Education is a transformative process that has been passed down through generations, evolving from ancient traditions into an essential practice for personal growth and development. In learning environments, education occurs through dynamic interactions between teachers and students, where both parties engage in a reciprocal exchange of knowledge. It is crucial for education to be integrated within the learning process, as its ultimate goal is to nurture and shape individuals into morally upright, creative, innovative, and independent citizens, who are also committed to contributing to a democratic and responsible society.

In the 21st century, education has undergone a profound transformation, primarily driven by Industry 4.0, which focuses on the virtual world, particularly the internet. This shift has led to the rise of digital education systems, fundamentally changing the way we learn. Online learning, or e-learning, is a powerful method based on three key elements: (1) the ability to update, store, and distribute lessons, (2) the delivery of lessons via the internet to end users, and (3) offering a broader perspective on education beyond traditional paradigms (Jayanti & Indrakurniawan, 2022). Online learning, as a form of distance education, allows for asynchronous and synchronous learning experiences using platforms such as Zoom, Google Meet, WhatsApp, and more.

Conversely, offline or face-to-face learning is a traditional classroom method that necessitates the physical presence of the teacher. In this setting, students engage in spontaneous verbal communication, and motivation plays a crucial role in driving their participation in the learning process. Teachers must craft compelling lessons that encourage students to actively engage and strive for academic success (Aprianty & Astuti, 2024).

The evolution of online learning, which includes distance education, is characterized by the use of various digital tools, enabling remote communication and collaboration. Applications such as Zoom, YouTube, WhatsApp, and Google Meet facilitate these interactions, offering new opportunities for education in both formal and informal settings. Governments and educational institutions are continually working to overcome the challenges of online learning, such as limited internet access and technological devices, while developing curricula and support systems to enhance the online learning experience (Greenhow et al., 2022; Hermanto & Srimulyani, 2021; Basar et al., 2021; Simamora, 2020; Ferri et al., 2020).

Offline learning remains a valuable method across educational levels. Offline learning provides a direct and tangible educational experience that fosters deeper understanding. Meanwhile, online learning offers the flexibility of independent access from home, though it requires active and critical student engagement (Mushtaha et al., 2022; Müller & Mildenberger, 2021). Tools like Zoom and WhatsApp have proven especially effective in facilitating both synchronous and asynchronous learning, particularly in subjects like chemistry (Al Abiky, 2021; Alsharif et al., 2020).

The effectiveness of any learning program should be assessed not only by student achievement but also by the quality of the learning process and the availability of supporting resources. In an ever-changing world, education must adapt to the evolving needs of society, equipping students with the necessary knowledge and skills to navigate life. Learning outcomes can be enhanced through engaging experiences that involve problem-solving, communication, reasoning, and critical thinking. Teachers play a crucial role in fostering these skills through effective instructional practices (Onu et al., 2024).

In fields such as science, supplementary teaching materials and media are essential to stimulate student interest and improve learning outcomes. Effective learning media help clarify complex concepts, support student engagement, and promote better understanding (Nasution & Rizka, 2024). Online learning platforms like Zoom, Google Meet, and WhatsApp have become central tools in facilitating communication and learning, offering a blend of synchronous and asynchronous learning opportunities.

Despite the numerous benefits of online education, challenges remain. Issues such as unstable internet access, device limitations, and socioeconomic disparities continue to affect students' ability to participate fully in online learning. Internal factors such as a student's desire to learn, along with external support from family and technology, are critical to successful online learning experiences.

To address these challenges, a hybrid approach combining online and offline learning is gaining traction. This model offers a balanced solution that accommodates students' diverse needs and circumstances, mitigating issues such as access to technology, while still allowing for flexibility and interactivity (Harahap et al., 2019).

This study aims to explore the preferences of students in the Chemistry Department at Universitas Negeri Medan regarding online, offline, and hybrid learning methods. Specifically, the study investigates the factors influencing these preferences and how they relate to students’ learning experiences and outcomes.

Rationale of the Study

This research is critical as it seeks to understand the evolving educational landscape in higher education, especially in the context of the digital age. With the widespread adoption of digital technologies, it is essential to assess how students interact with and perceive various learning methods. By investigating these preferences, this study aims to provide valuable insights for educators and institutions to tailor their teaching strategies to better meet students’ needs, enhance engagement, and overcome the challenges posed by both online and offline learning environments. Furthermore, the findings will inform the development of hybrid learning models that can effectively combine the benefits of both approaches, ensuring a more flexible, inclusive, and effective education system.

METHOD

The study utilized a mixed-methods approach, combining quantitative and qualitative data collection techniques to provide a comprehensive understanding of student preferences for learning systems. A Google Form survey was distributed to 110 students of chemistry department, chemistry education study program, Universitas Negeri Medan. The survey consisted of both closed-ended questions to capture numerical preferences and open-ended questions to gather qualitative insights. To strengthen the findings, semi-structured interviews were conducted with 15 participants selected from the survey respondents to further explore their reasoning and experiences.

The survey questions were designed to capture.

1. Students' preferred mode of learning (online, offline, or hybrid).
2. Reasons for their preference.
3. Challenges associated with each learning method.

Participants for the survey and interviews were chosen through purposive sampling to ensure diversity in terms of academic discipline, year of study, and prior experience with different learning systems. Data collection occurred over a three-week period. Quantitative data were analyzed using descriptive statistics, while qualitative responses from open-ended questions and interviews were subjected to thematic analysis to identify recurring themes and deeper insights.

FINDINGS AND DISCUSSION

The findings reveal a clear distribution of preferences among the 110 survey respondents as shown by Tabel 1 and Figures 1, and are further supported by interview data that provide nuanced perspectives:

Table 1. Distribution of learning system preferences among students of chemistry department, chemistry education study program, Universitas Negeri Medan.

No.	Learning system preferences	Total	Percentage
1.	Online	10 Students	9.1%
2.	Offline	61 Students	55.5%
3.	Hybrid	39 Students	35.5%
	Total	**110 Students**	**100%**

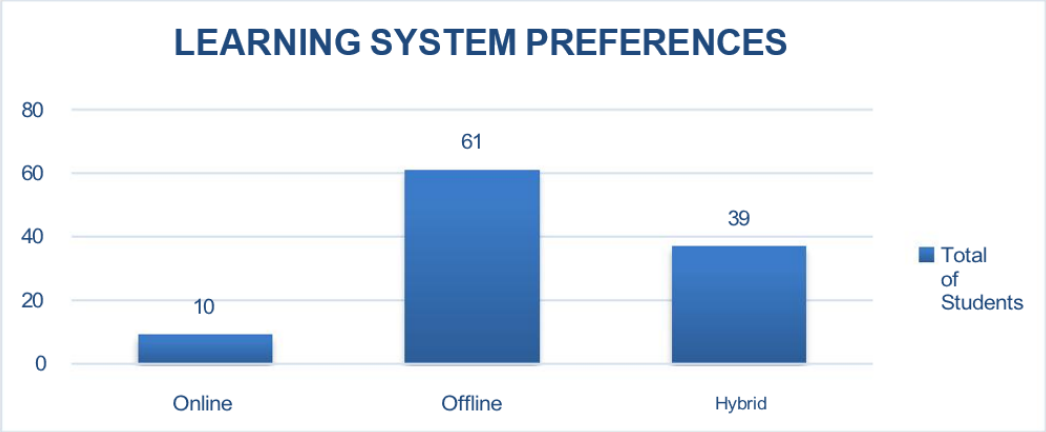

Figure 1. Distribution of learning system preferences among students of chemistry department, chemistry education study program, Universitas Negeri Medan.

Online Learning

Only 9.1% of students preferred online learning. Respondents highlighted the flexibility it offers, allowing them to balance studies with other responsibilities. Cost-effectiveness and the convenience of remote access were also frequently mentioned. However, challenges such as unreliable internet connections, limited opportunities for interaction, and difficulty maintaining focus were significant deterrents. Interviews revealed that students who preferred online learning often had other commitments, such as part-time jobs, which made flexibility a priority.

According to the results of the percentage of students who are interested in online learning, shown in Figure 2, the main reasons for their preference are cost-effectiveness (41.3%), time flexibility (22.8%), and the fact that they do not need to go to school or campus (13%).

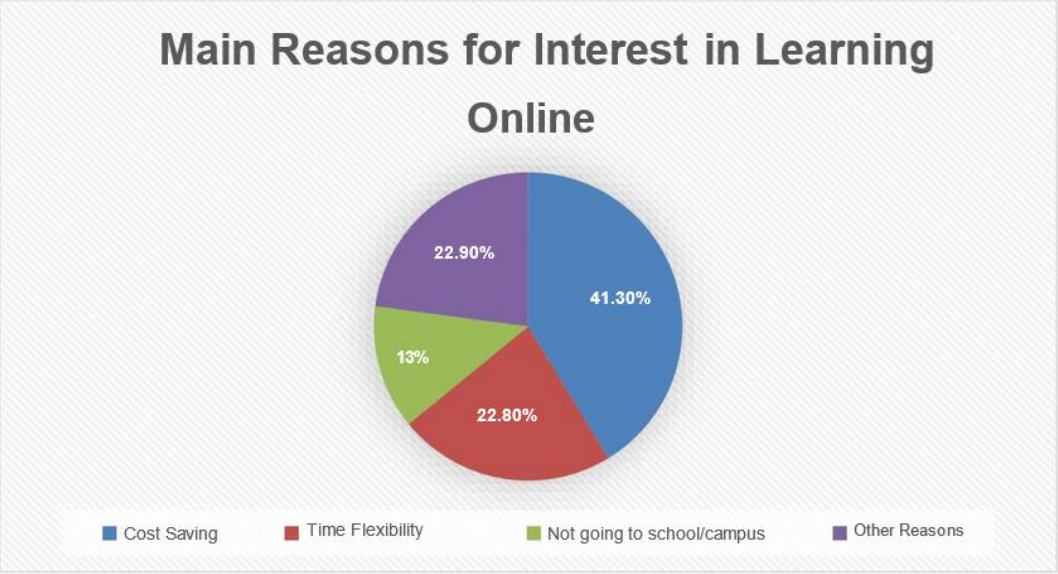

Figure 2. Students' main reasons for their preference in online learning.

In Figure 3, students' opinions about the level of interest in online learning, particularly in terms of the convenience of using applications like Zoom, Google Meet, and Moodle, are shown. Some feel that using the applications is quite comfortable (66.7%), others feel less comfortable (21.3%), and some feel very comfortable (9.3%).

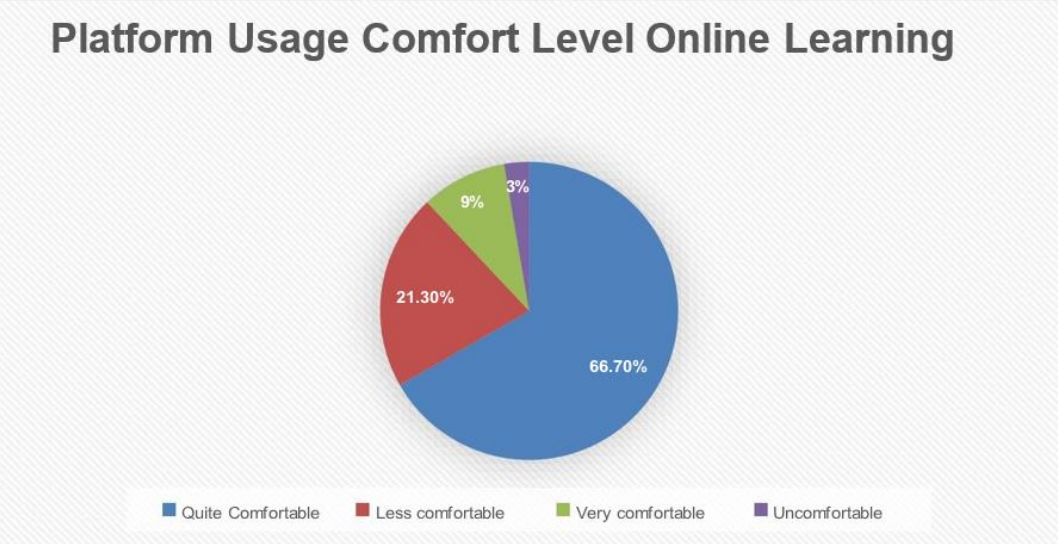

Figure 3. Students' opinions about platform usage in online learning.

From the results of the percentage of students who are interested in online learning, in Figure 4, there are the biggest obstacles that have been faced during online learning, namely unstable internet connection (47.2%), difficulty understanding the material (30.6%), lack of interaction with teachers and lecturers (15.7%) and the absence of a conducive learning environment (6.5%).

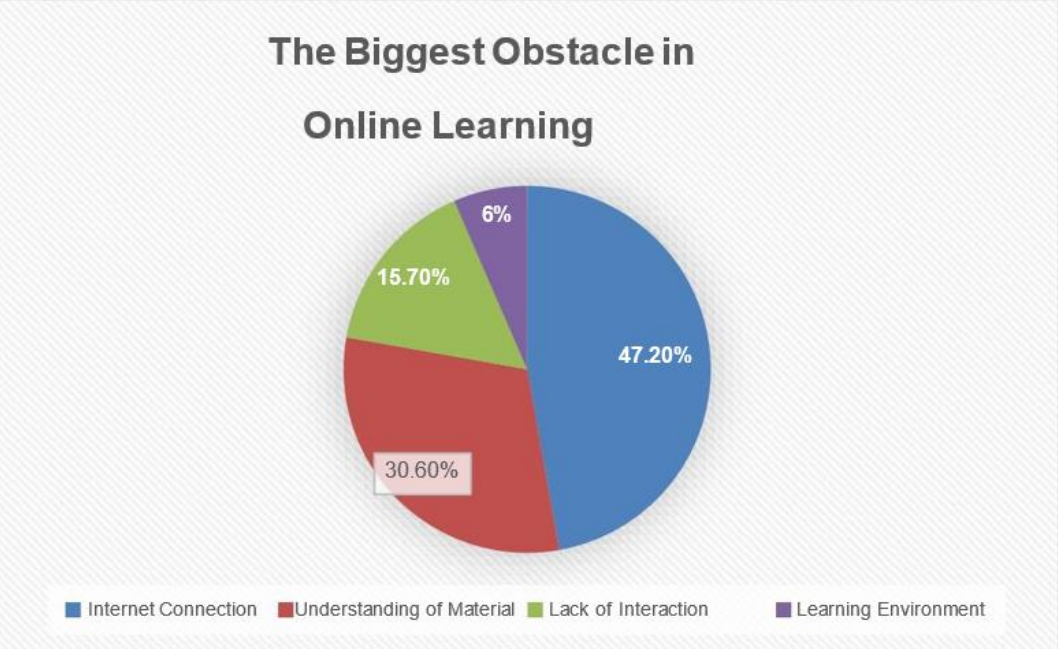

Figure 4. Students' biggest obstacles in online learning.

Offline Learning

The majority, 55.5%, of students opted for offline (face-to-face) learning. They emphasized its effectiveness in enhancing understanding of the material through direct interaction with instructors and peers. Many students noted that the structured environment of classrooms helped maintain discipline and focus, making it easier to engage in discussions and seek clarification. Interviewees elaborated that face-to-face learning provided a sense of community and motivation, which they found lacking in online settings.

Based on the percentage of students interested in offline learning, shown in Figure 5, the main reasons for their preference are a better understanding of the material (54.6%), the ability to interact directly with teachers and lecturers (34.3%), and being more disciplined in learning (5.6%).

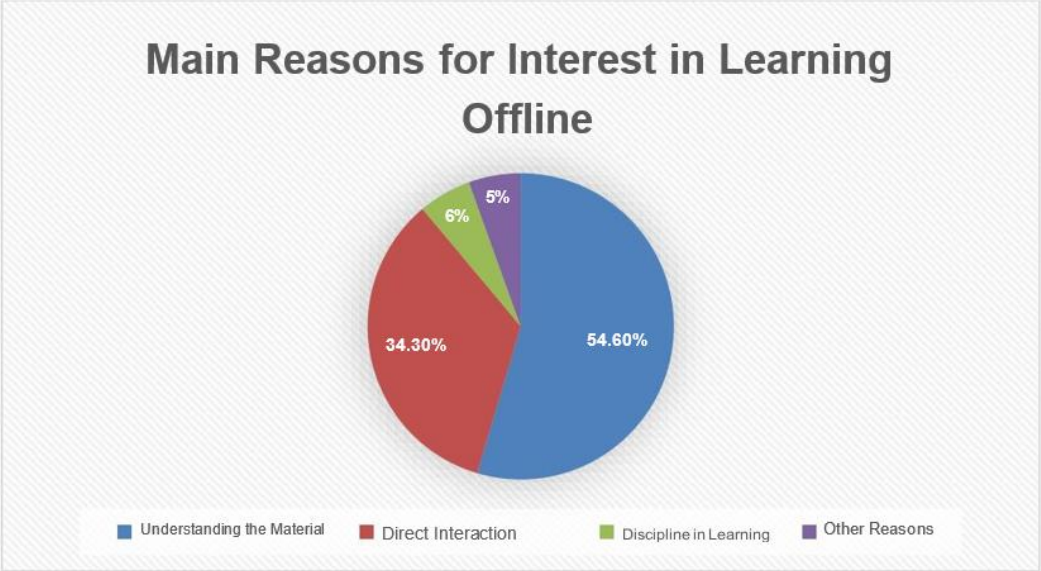

Figure 5. Students' main reasons for their preference in offline learning.

According to the percentage of students interested in offline learning, shown in Figure 6, the biggest obstacles faced during offline learning are transportation costs and other needs (54.2%) and travel time to school or campus (35.5%)

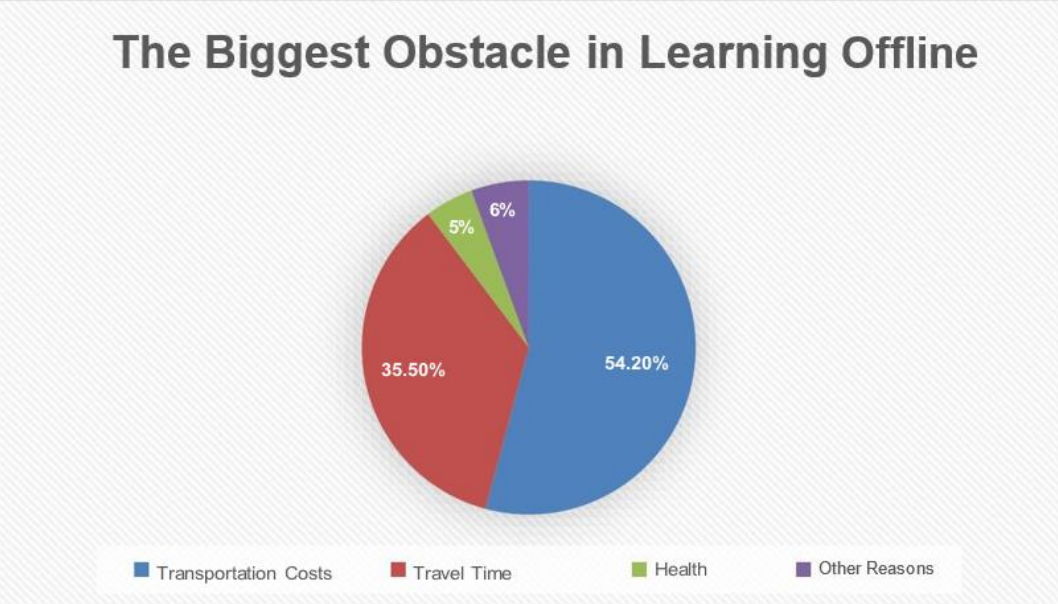

Figure 6. Students' biggest obstacles in offline learning.

Hybrid Learning

A significant 35.5% of students preferred a hybrid model, which combines online and offline elements. Survey responses highlighted this method as the optimal

balance, offering flexibility without sacrificing interaction and engagement. Interview data revealed that students appreciated the adaptability of hybrid learning, as it allowed them to attend classes in person when feasible and switch to online when faced with scheduling conflicts or transportation issues. Students also noted that hybrid models mitigated monotony by varying the mode of instruction.

Based on the Figure 7, students' opinions about online learning being as effective as offline learning are presented, with 55.6% feeling it is less effective, 33.3% finding it quite effective, and 9.3% feeling it is not effective at all.

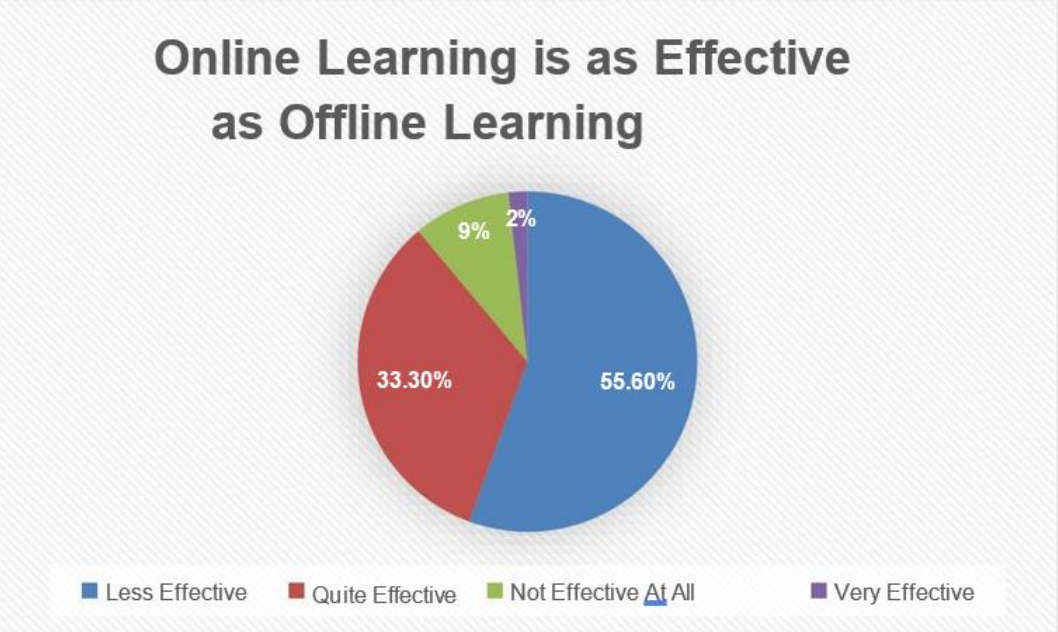

Figure 7. Students' opinions about online learning being as effective as offline learning.

Based on the results of the study, many students are interested in both offline and online learning. In Figure 8, the interaction between students and teachers or lecturers in online learning compared to offline learning is shown. Most students stated that interaction is better offline (74.1%), some stated it is the same (13.9%), and others stated it is better online (11.1%).

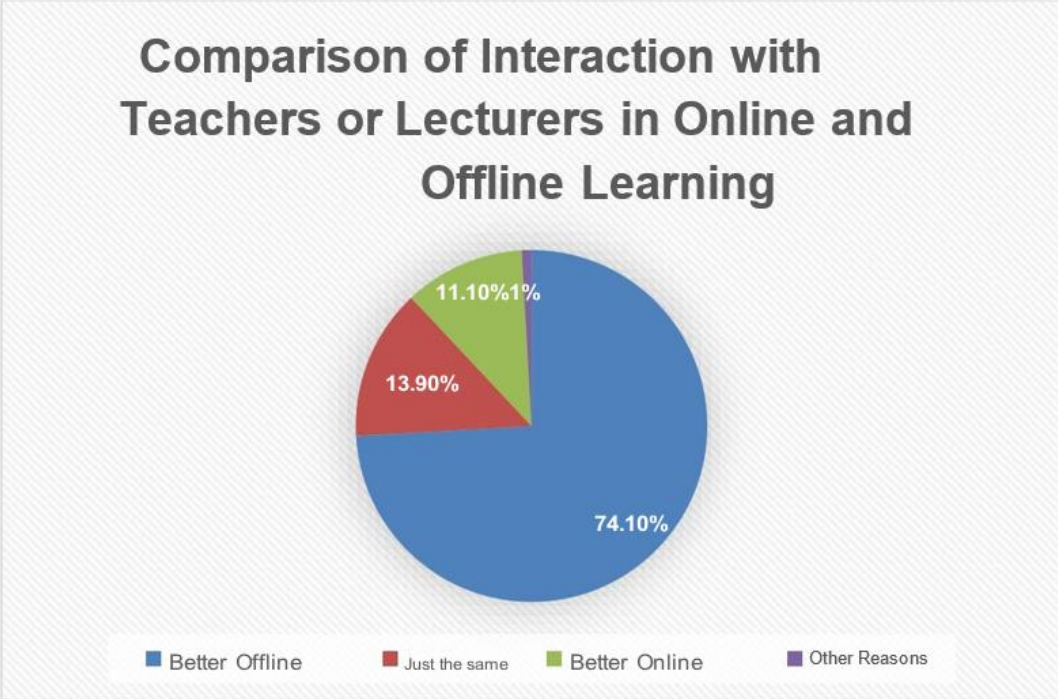

Figure 8. Comparison of interaction between students and teachers or lecturers in online learning and offline learning.

According to the results of the study, regarding the number of students interested in both offline and online learning, Figure 9 shows their opinions on the ease of accessing learning materials in the online system compared to offline. Some stated that access to materials is easier offline (54.6%), with 22.2% stating it is very easy offline. Some also stated that it is easier online (12%), and 11.1% stated it is very easy online.

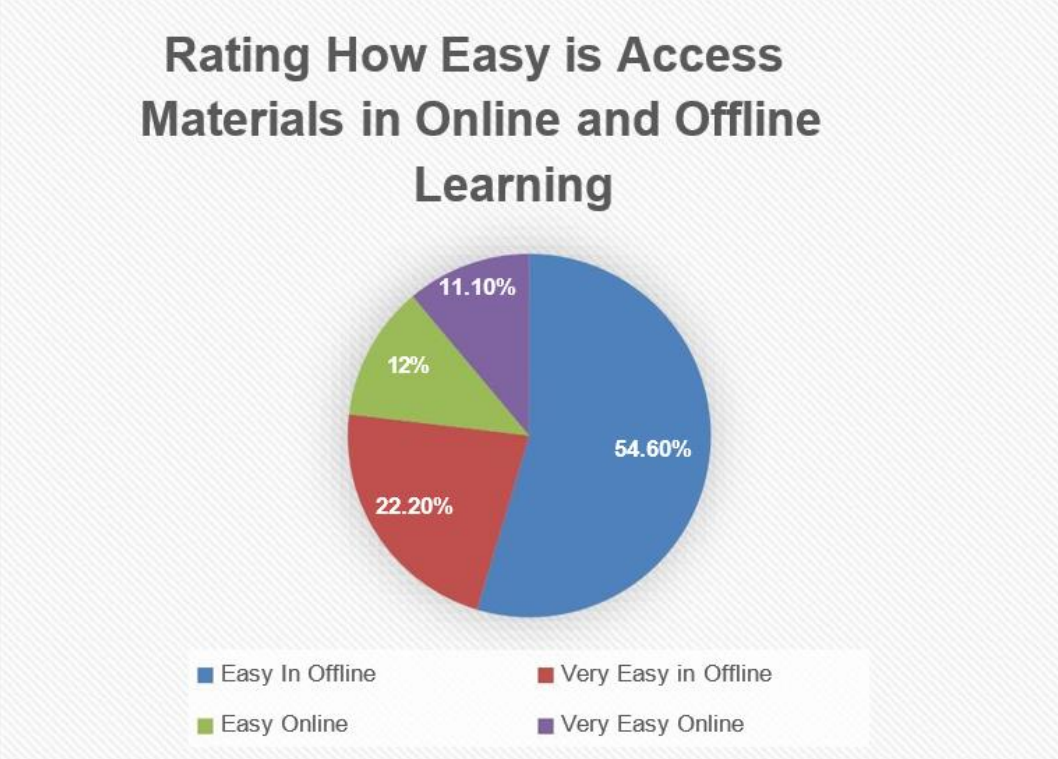

Figure 9. Comparison of students opinions on the ease of accessing learning materials in the online system compared to offline.

Qualitative data from interviews further illuminated the challenges students face. Those favoring online learning often cited technical issues, while students preferring offline or hybrid methods mentioned difficulties in adapting to purely digital environments, particularly for subjects requiring hands-on practice or detailed discussions.

CONCLUSION

This study highlights the varied preferences of students for online, offline, and hybrid learning systems in higher education, each influenced by specific advantages and challenges. Offline learning remains the most preferred due to its effectiveness in fostering understanding and interaction. However, the flexibility and cost-effectiveness of online learning cannot be overlooked, particularly for students with external commitments. The hybrid approach emerges as a promising solution, combining the strengths of both systems and addressing key challenges such as internet access, device limitations, and transportation costs. Educational institutions should consider adopting flexible, blended learning strategies tailored to diverse student needs. By integrating the strengths of online and offline methods, institutions can create a more inclusive and effective learning environment, ultimately enhancing educational outcomes in the digital age.

REFERENCES

Al Abiky, W. B. (2021). Days without schools: The effectiveness of WhatsApp, as an English learning tool, during COVID-19 pandemic. *Revista Argentina de Clínica Psicológica*, *30*(1), 774. https://doi.org/10.24205/03276716.2020.2074

Alsharif, A. T., Alsharif, B., Alsharif, L., Althagafi, N., Natto, Z. S., & Kassim, S. (2020). Effectiveness of WhatsApp as a part of a hybrid learning environment: an opportunity for post-COVID-19 pandemic pedagogy. *J Contemp Dent Pract*, *21*(12), 1331-6. https://doi.org/10.5005/jp-journals-10024-2978

Aprianty, R., & Astuti, E. T. (2024). Effectiveness of Project Based Learning Model with Canva Media Assisted in Islamic Education Learning. *JIE (Journal of Islamic Education)*, *9*(2), 754-764. https://doi.org/10.52615/jie.v9i2.437

Basar, Z. M., Mansor, A. N., Jamaludin, K. A., & Alias, B. S. (2021). The effectiveness and challenges of online learning for secondary school students–A case study. *Asian Journal of University Education*, *17*(3), 119-129. https://myjms.mohe.gov.my/index.php/AJUE/article/view/14514

Ferri, F., Grifoni, P., & Guzzo, T. (2020). Online learning and emergency remote teaching: Opportunities and challenges in emergency situations. *Societies*, *10*(4), 86. https://doi.org/10.3390/soc10040086

Greenhow, C., Graham, C. R., & Koehler, M. J. (2022). Foundations of online learning: Challenges and opportunities. *Educational Psychologist*, *57*(3), 131-147. https://doi.org/10.1080/00461520.2022.2090364

Harahap, F., Nasution, N. E. A., & Manurung, B. (2019). The Effect of Blended Learning on Student's Learning Achievement and Science Process Skills in Plant Tissue Culture Course. *International Journal of Instruction*, *12*(1), 521-538. https://doi.org/10.29333/iji.2019.12134a

Hermanto, Y. B., & Srimulyani, V. A. (2021). The challenges of online learning during the covid-19 pandemic. *Jurnal Pendidikan Dan Pengajaran*, *54*(1), 46-57. http://repositori.ukdc.ac.id/833/

Jayanti, Z. D., & Indrakurniawan, M. (2022). Parents' Role in Online Learning by Elementary School Students During the COVID-19 Pandemic. *KnE Social Sciences*, 261-276. https://doi.org/10.18502/kss.v7i12.11530

Müller, C., & Mildenberger, T. (2021). Facilitating flexible learning by replacing classroom time with an online learning environment: A systematic review of blended learning in higher education. *Educational Research Review*, *34*, 100394. https://doi.org/10.1016/j.edurev.2021.100394

Mushtaha, E., Dabous, S. A., Alsyouf, I., Ahmed, A., & Abdraboh, N. R. (2022). The challenges and opportunities of online learning and teaching at engineering and theoretical colleges during the pandemic. *Ain Shams*

Engineering Journal, *13*(6), 101770. https://doi.org/10.1016/j.asej.2022.101770

Nasution, N. E. A., & Rizka, C. (2024). Investigating University Student's Acceptance of Virtual and Remote Labs in Their Learning. *Lentera Pendidikan : Jurnal Ilmu Tarbiyah Dan Keguruan*, *27*(1), 47-62. https://doi.org/10.24252/lp.2024v27n1i4

Onu, P., Pradhan, A., & Mbohwa, C. (2024). Potential to use metaverse for future teaching and learning. *Education and Information Technologies*, *29*(7), 8893-8924. https://doi.org/10.1007/s10639-023-12167-9

Simamora, R. M. (2020). The Challenges of online learning during the COVID-19 pandemic: An essay analysis of performing arts education students. *Studies in Learning and Teaching*, *1*(2), 86-103. https://doi.org/10.46627/silet.v1i2.38