A Case Study: The Secondary Students Overall Satisfaction on Online Learning

S M Mohd[1], N M Jan[2], F M Idris[3], H Kaco[4], S Kamarudin[5]

[1-4] Kolej PERMATA Insan, Universiti Sains Islam Malaysia, Bandar Baru Nilai, Negeri Sembilan, Malaysia

[5]Faculty of Computer Science and Information Technology, University Putra Malaysia, Serdang, Selangor

E-mail: smunirahm@usim.edu.my[1], nurhidaya.mj@usim.edu.my[2], fadzidahmohdidris@usim.edu.my[3], hatikakaco@usim.edu.my[4], shafinah@upm.edu.my[5]

Abstract. Online learning has revolutionized education by offering a flexible platform that transcends geographical boundaries and time constraints. It provides various multimedia resources, interactive exercises, and personalized feedback, enhancing the learning experience. However, online classes have challenges, such as decreased student engagement, technical issues, and a lack of structure, leading to procrastination and decreased productivity. This research aims to delve into the level of satisfaction experienced by talented high school students in terms of their virtual classroom experience. The study was conducted through an online survey using purposive and convenient sampling techniques. The data analysis showed that most students expressed satisfaction with the online classes, indicating that they found them informative, engaging, and meaningful. However, a few minor adjustments could be made to enhance students' experience, such as more opportunities for interactive participation, additional resources, and more precise instructions. Overall, the research highlights the positive impact of online education on the learning experience of gifted high school students.

Keywords: online education; high school students; teaching mode; technology.

1. Introduction

Before COVID-19, many universities conducted online classes and face-to-face sessions for students across several disciplines. However, the recent COVID-19 pandemic created a need for online instruction, resulting in significant technological investments. In the pre-COVID era, universities were already transitioning towards integrating online classes alongside traditional face-to-face sessions. This approach was particularly beneficial for students who had constraints in attending physical classrooms. However, the advent of the COVID-19 pandemic proved to be a catalyst in accelerating this transition to online learning, as universities worldwide were forced to shut down due to health and safety concerns, leading to an unprecedented surge in demand for remote instruction. This sudden need for online learning also resulted in universities making significant investments in technology to ensure the continuity of education for students [1][2].

Integrating digital tools and virtual spaces becomes increasingly essential for teachers and students as education evolves. The widespread availability of quick internet access has significantly impacted the dynamic interactions between students and lecturers [3][6-8]. The emergence of online platforms has brought about a significant transformation in the teaching and learning landscape. It has resulted in the amalgamation of face-to-face and online teaching modalities and, in some cases, entirely virtual instruction. This paradigm shift has been instrumental in enabling educational institutions to offer students more flexible and personalized learning experiences. Furthermore, online platforms can foster student engagement, as they allow for interactive learning experiences tailored to each student's individual needs [4]. The availability of digital learning resources has challenged the traditional belief that knowledge flows exclusively from instructors to students. Although online education offers many benefits, it cannot fully replicate the in-person classroom experience. However, this should not deter teachers from creating opportunities for students to enhance their interactive understanding of learning. By leveraging digital platforms to foster engagement and collaboration, teachers can provide a dynamic and practical learning experience that complements traditional teaching methods. Therefore, teachers must embrace the potential of online education to enrich their pedagogical approach and empower their students to achieve academic excellence [2].

Online education is becoming an increasingly popular alternative to traditional classroom settings, and it's easy to see why. Online courses offer numerous advantages, including increased accessibility to high-quality education. Students worldwide can now access top-notch courses and learn from the best instructors without having to leave their homes. One of the most significant benefits of online learning is the empowerment it provides. Students can access course materials and complete assignments at their own pace and on their own schedule. This is especially beneficial for students who have work or family obligations that prevent them from attending traditional classes. Online education enables them to take charge of their academic journey while still fulfilling their other responsibilities. However, it is essential to note that online education also presents its own set of challenges, such as the lack of face-to-face interaction, the potential for technological issues, and the need for self-discipline. Students in online courses may miss out on the opportunity to build meaningful relationships with their peers and instructors. This social interaction can be essential for academic success, providing students with the support and motivation they need to succeed. Therefore, online courses must provide opportunities for social interaction. This can be achieved through discussion forums, group projects, and live online sessions. By doing so, students can benefit from the flexibility and accessibility that online learning offers while still having the chance to build meaningful relationships with their peers and instructors. [5][9-14].

The structure of this study is organized as follows: Section 2 reviews the existing education literature. Section 3 details the methodology employed in the research. Section 4 analyzes the collected data and discusses the findings. Finally, Section 5 concludes the study, summarizing the main results and their implications.

2. Literature Review

Education is significantly transformed by rapid technological advancements and changing societal needs. Digital tools and online learning platforms have revolutionized traditional classrooms, providing students greater flexibility and access to resources while promoting self-directed learning and time management skills. This shift has also led to a move from teacher-centred instruction to student-centred learning, emphasizing critical thinking, creativity, and problem-solving skills through inquiry-based approaches. As education continues to evolve, it is crucial to adapt and innovate to meet the diverse needs of today's learners. By creating more engaging, effective, and inclusive learning environments, educators can better prepare students for the complexities of the modern world. Integrating technology in education not only enhances the learning experience but also plays a crucial role in bridging gaps in access to quality education. This transformation requires continuously updating teaching methods, curricula, and assessment strategies to align with the skills needed in the 21st century. Ultimately, the goal is to foster a learning environment

that supports lifelong learning and equips students with the knowledge and skills necessary to thrive in an ever-changing global landscape

2.1 Changing Tides in Education

The technological evolution over the last fifty years has profoundly transformed education, responding to the changing social and economic needs. Initially, Education 1.0 mirrored traditional classrooms where teachers predominantly disseminated knowledge, with students accessing information through e-books and websites passively. There needed to be more interactivity, as students could not comment, share, or engage with the content, limiting their learning experience to passive knowledge acquisition. The advent of Education 2.0 marked a significant milestone, aligning with the principles of Web 2.0. This era introduced a more interactive and collaborative learning environment where education was no longer a one-way street. Learning became a dynamic interaction between teachers and students, students and their peers, and students and educational content, including interactions with experts. Synchronous and asynchronous communication allowed students to engage in academic projects globally, fostering a sense of community and collaboration across continents. This era saw the emergence of online communities where students could comment, modify, and share content, making learning a more active and engaging process. Education 3.0 further revolutionized the educational landscape by emphasizing personalized learning tailored to students' interests, innovation, and creativity. In this model, students play a central role as creators of knowledge artifacts, which they share within online communities. This shift in learning dynamics, where students are not just recipients but also creators of knowledge, is a crucial feature of Education 3.0. Teachers, rather than being mere providers of knowledge, facilitate an educational environment where students collaboratively develop their understanding. Content sharing became open and modifiable, enhancing the creative networking aspect of learning. This shift encouraged students to take an active role in their education, fostering a strong sense of ownership and proactive learning behaviour. Currently, Education 4.0 represents a new phase integrating humanist ideas with digital advancements. Key trends include remote learning opportunities, personalized learning experiences through computer applications, and the BYOD (Bring Your Own Device) approach, allowing students to choose how they learn. These trends are shaping the current phase of education, providing students with more flexibility and control over their learning. Education now emphasizes practical, project-based activities that develop organizational, cooperation, and time management skills essential for future careers. The assessment of educational achievements has evolved to focus on real-time knowledge application and project-based evaluations. Education 4.0 also values student input in curriculum design, shifting the responsibility of learning from teachers to students. This concept aims for sustainable development by integrating social, cultural, and educational activities into digital media, leveraging technologies like AI, IoT, and Big Data to enhance the learning experience continuously [15-16,19]. Figure 1 shows the method used and the adoption of technology in each phase of education [17].

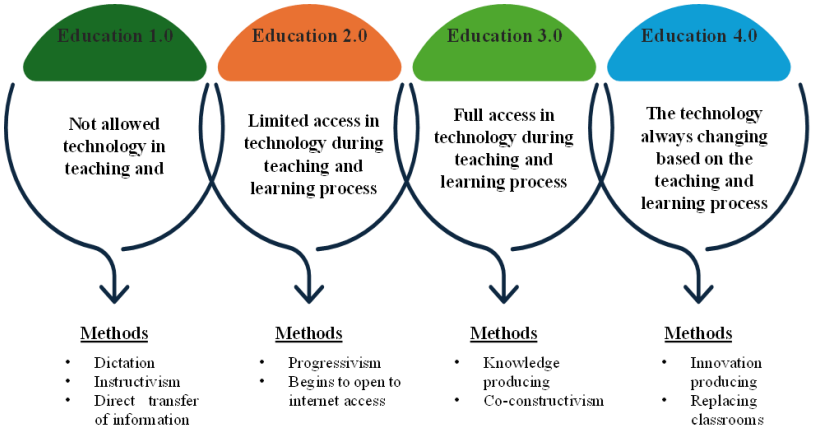

Figure 1. Education Revolution

The educational transformation process faces various significant challenges and obstacles, as detailed in Table 1 [18].

Table 1. Description of Challenges and Barriers in Education Transformations

Challenges and Barriers	Descriptions
Resistance to Change	Educational institutions frequently resist change due to entrenched traditions and bureaucratic structures. These structures stifle innovation and maintain the status quo, hampering the effective implementation of new educational strategies.
Lack of Resources	Inadequate resources are a major obstacle to educational transformation. Limited funding hampers investment in new technologies, modern infrastructure, and teacher training, while outdated facilities and insufficient tools obstruct the adoption of innovative educational practices.
Teacher Resistance	Educators may resist new teaching methods or technologies due to insufficient training, concerns about increased workload, and doubts about effectiveness. Teachers may feel unprepared and reluctant to adopt new approaches without proper support and professional development.
Policy Constraints	Government regulations, standardized testing, and rigid curriculum mandates often restrict innovation and flexibility in education by prioritizing compliance over creativity, making it difficult for educators to implement transformative changes.
Inequality and Access	Socioeconomic disparities are a significant challenge to educational transformation, as unequal access to resources and quality education worsen existing inequities. Students from disadvantaged backgrounds often lack the tools and support to benefit from transformative practices, increasing the achievement gap.
Siloed Approaches	Fragmented educational systems and isolated initiatives hinder collaboration and the widespread adoption of successful practices. When stakeholders work in isolation, sharing best practices and resources is limited, diminishing the impact of transformative efforts.
Resistance from Stakeholders	Parents, administrators, and community members might resist changes they view as threatening traditional educational values or structures. Their resistance often arises from concerns about potential impacts on

Challenges and Barriers	Descriptions
	student outcomes, doubts about new approaches' effectiveness, or a preference for established models.
Cultural and Societal Norms	Societal attitudes, cultural beliefs, and perceptions of success can conflict with transformative educational goals, hindering progress. Established cultural norms often dictate educational values, causing resistance to new practices that challenge these traditional views.

2.2 Blended learning

Blended learning is a modern approach to education that combines in-person teaching with online learning, aiming to maximize the benefits of both methods while addressing their limitations. This student-centred approach uses technology to promote independence, engagement, and achievement. Blended learning involves using online resources like PowerPoint presentations, streaming media, and emails in addition to traditional classroom activities. By integrating in-person teaching with digital tools, blended learning creates a dynamic learning environment that combines real and virtual interactions, making educators feel engaged. While definitions may vary, common elements of blended learning include combining virtual and physical learning spaces and using various forms of interaction to enhance the educational experience. Blended learning improves learning outcomes by integrating traditional and e-learning methods. It represents an evolution of conventional and e-learning, aiming to increase student motivation and academic performance by incorporating technology with face-to-face teaching [20-22]. Based on [20] five main elements of blended learning have been illustrated in Figure 2.

Blended learning is designed to mitigate the drawbacks of online learning and help students retain knowledge effectively. It combines traditional classroom teaching and technology-supported learning by integrating offline and online learning methods [23]. However, like online learning, blended learning also presents some challenges. Students may need help to stay focused on online materials, show disinterest in the content, find the lessons monotonous, and need help to engage fully in learning activities. With the post-pandemic education landscape emphasizing the need for blended learning, there has been a significant surge in the development of digital tools supporting distance learning, such as Zoom, Google Forms, and Quizizz. This surge is a clear indication of the current trends in education and keeps educators informed about the latest developments. As a result, there is a growing focus on studying the effectiveness of blended learning. This approach supports both teachers and learners and fosters creative and active thinking among students during their at-home study [23,24].

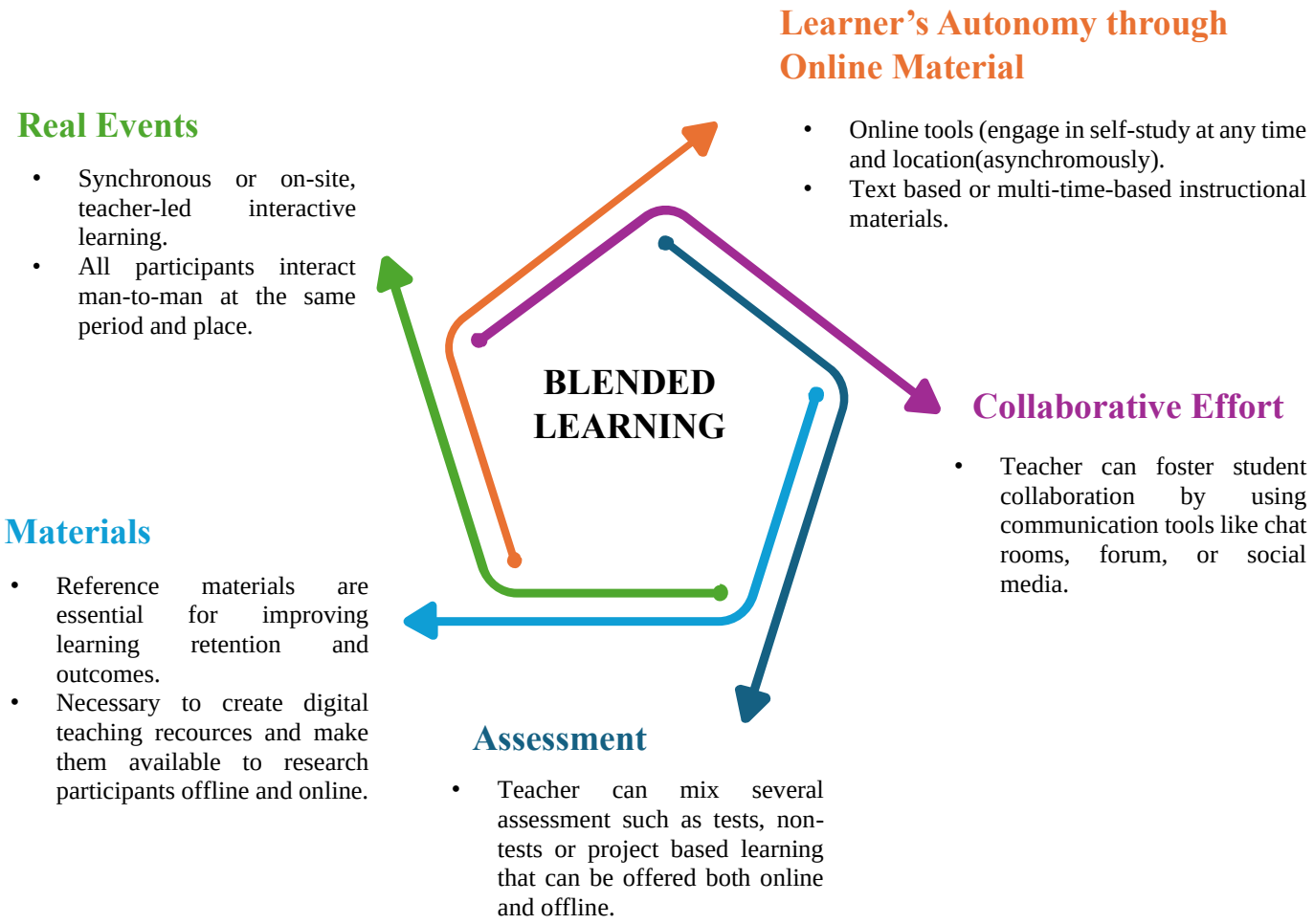

Figure 2. Elements of Blended Learning

3. Research Method

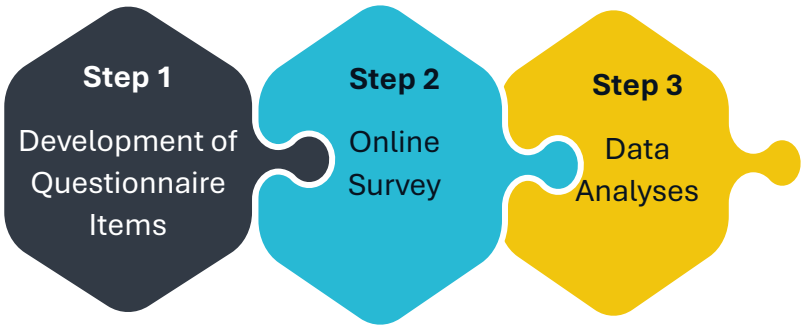

Figure 3. Process of Methodology

The study was conducted in three detailed phases, each highlighted in Figure 3. In the first phase, a comprehensive and thorough questionnaire was formulated, with a set of questions arranged in a specific order. The questionnaire was designed to gather data on particular aspects of the study subject. In the second phase of the study, an online survey was conducted. The survey was distributed among Kolej PERMATA Insan students who were enrolled in classes using the Microsoft Teams platform for online learning. The survey was conducted using purposive and convenient sampling methods, ensuring a representative sample of the population under study, thereby enhancing the reliability of our findings. In the third and final phase of the study, the data collected from the online survey was meticulously and comprehensively analysed. The findings from the analysis were then used to draw conclusions and make recommendations for further research in the field.

4. Result and Discussion

The survey, conducted on a sample of 43 students, revealed that 58 percent of the respondents were male students, while 48 percent were female students shown in Figure 4. This indicates that there is a slight majority of male students in the sample. It is worth noting that the sample size is relatively small and may not be representative of the entire student population. Nonetheless, the survey results provide some insight into the gender composition of the student body.

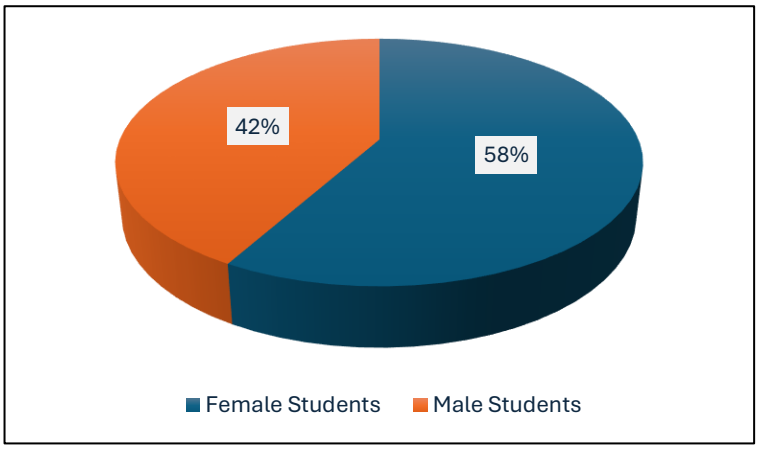

Figure 4. The percentage of students answering the questionnaire item

The information depicted in Figure 5 provides insight into students' level of contentment regarding the online learning approach adopted during the teaching and learning process. The feedback was affirmative, with most students indicating their satisfaction with the online learning experience. However, ten students expressed their discontent with it, while one respondent found it arduous to cope with online classes. It's worth noting the resilience of these students, who despite the challenges, have shown a commendable effort in adapting to this new learning environment.

Many students have reported giving positive feedback on the effectiveness of online classes as they significantly reduce the need for physical attendance. Furthermore, students have expressed a desire for a specific module tailored to the needs of online courses, considering the differences between online and physical classes. The educators have been able to use innovative techniques to keep the students engaged and interested during the online classes, which resulted in the students' easy comprehension of the course content. This appreciation from the students is a testament to the educators' dedication and commitment to their learning.

Despite the overall positive feedback, some students encountered challenges with online classes. Issues with internet availability and connectivity were a significant barrier for a few students, leading to

missed classes and frustration. Others struggled with maintaining focus during extended online sessions, which had a different impact on their mental and visual capabilities compared to physical classes. Additionally, the reduced two-way communication during online classes was a common concern, negatively affecting the learning experience for some students.

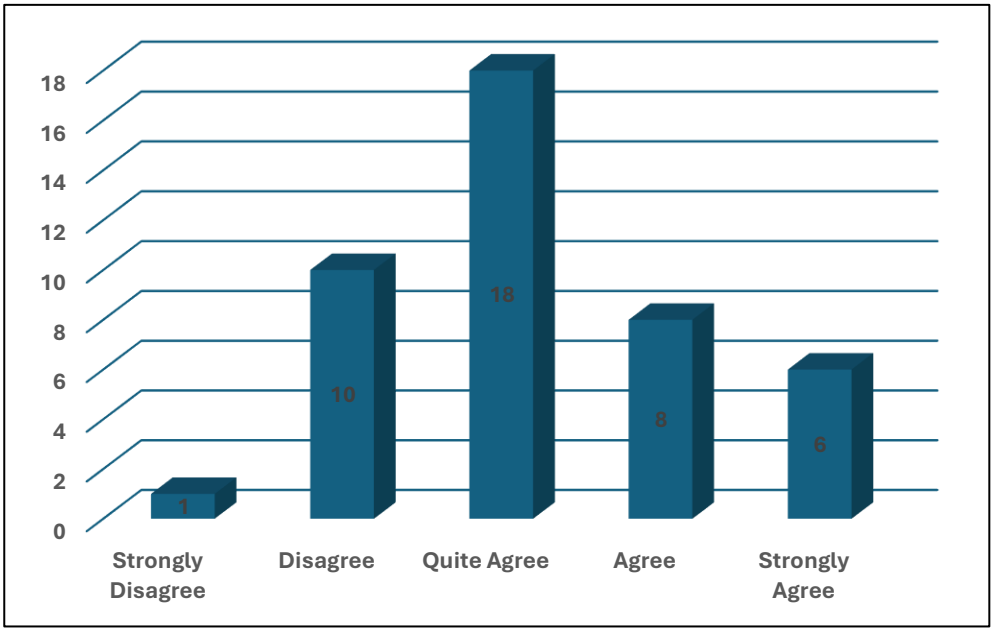

Figure 5. The number of students satisfy learn using Microsoft Team

5. Conclusion

In conclusion, online learning offers several benefits, including enhanced accessibility, flexibility, availability of multimedia resources, and personalized feedback. However, virtual classrooms can pose various challenges, such as decreased student engagement, technical issues, and self-discipline problems. To ensure the effectiveness of online learning, educators must take steps to foster student engagement, provide technical support, and promote time management skills.

6. References

[1] Karen Shastri, and Brian Hogan, "Education delivery modes: a post-covid study of traditional and online classes in managerial accounting," Developments in Business Simulation and Experintial Learning, Proceedings, vol. 51, pp. 2-13, 2024.

[2] Kereng Gilbert Pule, and Mbazima Amos Ngoven, "Perceived effectiveness of online learning for mathematics pre-service teachers in a rural university during the covid-19 pandemic," International Journal of Social Science Research and Review, vol. 7(2), pp. 148 -162, 2024.

[3] Engelbrecht, J., Borba, M.C., Llinares, S. et al., "Will 2020 be remembered as the year in which education was changed?, " ZDM Mathematics Education, vol. 52, pp. 821–824, 2024.

[4] Trenholm, S., & Peschke, J., "Teaching undergraduate mathematics fully online: a review from the perspective of communities of practice.," International Journal of Educational Technology in Higher Education, vol. 17(1), pp. 1-18, 2020.

[5] M. Kamraju et al., "Exploring the impact of online education on higher education," ASEAN Journal of Educational Research and Technology, vol. 3(1), pp. 27 -36, 2024.

[6] Anh, D.H.M.," Factors affecting satisfaction on online education on students digital teaching page in Ho Chi Minh City," Vietnam. Indonesian Journal of Multidiciplinary Research, vol. 2(1), pp. 179-186, 2022.

[7] Llupar, M.L., Malones, L.J.L., Sombria, A.J.F., and Calixtro, V.L., "Development of folkdance videos for e-learning," Indonesian Journal of Teaching in Science, vol. 2(1), pp. 1-6, 2022.

[8] Phanse, S., "The online education impact on students during covid- 19 pandemic," Indonesian Journal of Teaching in Science, vol. 1(2), pp. 137-140, 2021.

[9] Rawatee Maharaj-Sharma, "Secondary school students' experiences in online physics learning duuring the covid-19 pandemic: a phenomenological examination from trinidad and tobago, " Internation Consortium for Research in Science & Mathematics Education, vol. 27 (4), pp. 141 -156, 2023.

[10] Dziuban, C., Graham, C.R., Moskal, P.D., Norberg, A., & Sicilia, N., "Blended learning: The new normal and emerging technologies," International Journal of Educational Technology in Higher Education, vol. 15(1), pp. 1-16, 2018.

[11] Borup, J., Walters, S., & Call-Cummings, M.,"Student perceptions of their interactions with peers at a cyber charter high school," Online Learning, vol. 24(2), 2020.

[12] Zhu, C., Kintu, M. J., & Kagambe, E., "Blended learning effectiveness: The relationship between student characteristics, design features and outcomes," International Journal Educational Technology High Education, vol. 14(7), 2023.

[13] Ebenezer O.B. and Samuel A. O, "Influence on online and physical classrooms on students academic performance," Indonesian Journal of Multidisciplianry, vol. 4(1), pg. 27-40, 2024.

[14] Yakubu, M. N., and Dasuki, S. I., "Adoption of e-learning technologies among higher education students in Nigeria," Education and Information Technologies, vol. 2(1), pp. 12–18, 2020.

[15] Huk, T., "From Education 1.0 to Education 4.0 - Challenges for the Contemporary School," The New Educational Review, pp 36-46, 2021.

[16] Mukul, E., & Büyüközkan, G., "Digital transformation in education: A systematic review of education 4.0," Technological Forecasting and Social Change, vol 194, 2023.

[17] Ismail, S., & Haniff, W., "Education 4.0: The effectiveness of VARK learning style towards actualising Industrial Revolution 4.0," Journal of Educational and Social Research, vol.10(3), 2020.

[18] Krishna, K., & Chetry, K., "Transforming education: paradigm shifts in 21st century learning," International Journal of Multidisciplinary Research, vol 2(5), pp. 469-479, 2024.

[19] Miranda, J., Navarrete, C., Noguez, J., Molina-Espinosa, J.-M., Ramírez-Montoya, M.-S., Navarro-Tuch, S. A., Molina, A., "The core components of education 4.0 in higher education: Three case studies in engineering education," Computers & Electrical Engineering, vol.93, 107278, 2021.

[20] Prisha Jain, Chaya Ravindra, "Classifying emotional engagement in online learning via deep learning architecture," International Journal of Advanced Engineering, Management and Science, vol.10(5), pp. 063-070, 2024.

[21] Bidari, S., & Hafeez, M., "Evolution and impact of blended learning in higher education: a brief systematic review from 2010 to 2022," Journal of Education and Research, vol. 13, pp. 24-54, 2023.

[22] Nkanyani, T. E., Mudau, A., & Sikhosana, L., "Teaching and learning of physical sciences grade 11 in rural schools through rural blended learning strategy.," Eurasia Journal of Mathematics, Science and Technology Education, vol. 20 (3), 2024.

[23] Y. Wei, Y. Shi, H. H. Yang and J. Liu, "Blended Learning versus Traditional Learning: A Study on Students' Learning Achievements and Academic Press," International Symposium on Educational Technology (ISET), Hong Kong, China, 2017, pp. 219-223, 2017.

[24] Zainil, M., Helsa, Y., Sutarsih, C., Nisa, S., Sartono, & Suparman, S., "A needs analysis on the utilization of learning management systems as blended learning media in elementary school," Journal of Education and e-Learning Research, vol.11, pp. 56-65, 2024