

BLENDING LEARNING TAXONOMY

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ABSTRACT

The use of information technology in education has undeniable potential to improve teaching quality and learning dexterity. The Covid-19 pandemic that swept the globe, particularly in Indonesia, created havoc, particularly in the school system. The education dilemma brought on by the Covid-19 pandemic has resulted in issues that are inextricably linked to the rise of the digitalization revolution in education. As a result, it is vital to learn utilizing electronic equipment and services known as e-learning. Blended learning is one of the e-learning models that can be employed in online learning. Blended learning is defined as a formal education program that includes times when students study content online and times when teaching is overseen in the classroom. This study offers a survey of the literature and research on the taxonomy of blended learning as follows: (1) The obstacles associated with blended learning are culture and blended learning environment, finding the correct design, time constraints, well-integrated teamwork, and communication. (2) blended learning based on web-support such as linking-the-lecturer curates, wrapping-the-lecturer guides, wisc-online, khan academy, VLE/LMS, PLE, personal learning networks, mashups, and mupples; (3) blended learning based on web-support such as wisc-online, khan academy, VLE/LMS, PLE, personal learning networks, mashups, and mupples.

Keywords: Blended Learning, Challenges, Learning Styles, Web-Support

1) INTRODUCTION

The quality, quantity, and efficacy of the usage of digital technology in the classroom during the learning process has been reported to be inconsistent (OECD, 2015). Although some have considered digital technology as a requirement for education, particularly in the digital era 4.0, others have argued that it is not. Education in the 4.0 era is a response to the demands of the industrial revolution, which urge people and technology to collaborate creatively and innovatively to generate new opportunities. According to Fisk (2017) a new perspective in learning encourages students to discover sources for learning skills and knowledge in addition to the skills and knowledge that must be learned. There are various questions concerning how and when it should be used, as well as if it alters and improves students' mathematical experiences in secondary school or further education.

The emergence of a new virus, Coronavirus disease 2019 (COVID-19), which was found at the end of December 2019, stunned the globe at the start of 2020. The education crisis caused by the Covid-19 pandemic has created issues that are inextricably linked to the rise of the digitalization revolution in education, where information technology has become a driving force in bridging the gap between the need for adaptation to educational visualization and the growth of the digitalization revolution in education.

Indonesia's Minister of Education and Culture supports educational initiatives that redirect classroom interactions to the online. Due to a variety of factors, teachers and lecturers are

increasingly relying on digital technology as a source of learning and the primary teaching location, notwithstanding current technology-related beliefs and practices (Bower, 2017). As a result, a sudden change can be viewed as an opportunity for a significant shift in the way mathematics educators use technology by requiring a platform model and teaching patterns in repositioning the way of delivering material so that the learning process becomes more interactive, prioritizing communication interactions between students, teachers as facilitators, and allowing it to occur. Internet capabilities have become a meeting place and learning process between individuals, and the learning process is carried out face-to-face or online in classroom teaching. Internet capabilities are not only limited to being the center of reference sources, but have also become a meeting place and learning process between individuals, and the learning process is carried out face-to-face or online in classroom teaching (Attard & Holmes, 2020).

Many innovative teaching methods, such as e-learning and blended learning, have emerged as a result of the digital era. More emphasis on blended learning will be discussed in this article. Blended learning, according to Horn and Staker, is a formal learning program in which a student learns at least through online delivery and time, place, route, and teaching, as well as at least one supervised brick and mortar location away from home. Each course or subject is linked to each student's learning path in order to give an integrated learning experience.

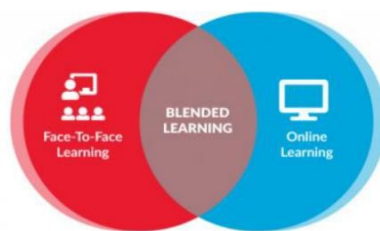


Figure 1. An Image of Blended Learning

Blended learning is a when you combine face-to-face learning and online learning (Suma et al., 2020). The Australian National Training Authority as quoted by Shivam & Singh (Suma et al., 2020) Blended learning, according to the author, is a combination of traditional learning with a web-based method. Blended learning, as a standard technique that combines traditional learning approaches with online learning, has already proven to be a versatile and effective instrument for learning that makes use of new electronic tools and media (Pikhart & Klimova, 2019). Various educational institutions in various parts of the world have used the models for adopting blended learning. Brooke (Cahya Dewi et al., 2018) there are four models that are generally implemented in blended learning namely Rotation model, Flex model, A La Carte model, and Enriched Virtual model. The four models must adjust to the technology employed, time, instructional learning, and efficacy in enhancing student skills when they are implemented.

There are many reasons why an instructor or learner might pick blended learning over other learning options. Graham et al. (Martínez-caro & Campuzano-bolarín, 2011) People chose blended learning for the following reasons: (1) improved pedagogy, in higher education, some lecturers have seen blended learning approaches increase the level of active learning strategies, peer-to-peer learning strategies, and learner-centred strategies used; (2) increased access and flexibility, there has been an increasing movement toward blended learning approaches where students can have opportunities for both online and offline learning; (3) increased access and flexibility, there has been an increasing movement toward blended learning approaches where students can have opportunities for both online and offline learning.

This article's main goal is to categorize the blended learning model. Transmission mode, learning style, and web support are used to categorize the content. A review of related research

on blended learning and its challenges is included in this article. This literature review is meant to offer educators with information that will help them develop a blended learning-based learning strategy.

2) METHODS

This is a library-based study. Secondary sources of data were used in this investigation. Secondary sources, according to the Elmer E. Rasmuson Library (2020) are the outcomes of other scholars' studies. The information found in original sources is described, analyzed, and/or evaluated in secondary sources. Secondary sources repackage information in order to make it more accessible. Books, journals, and proceedings were used as secondary sources in this study. According to the Elmer E. Rasmuson Library (2020), this research was carried out in stages. Limit the topic to be discussed (defining the topic), write a thesis or problem statement, make an outline, develop a source search strategy (developing a search strategy), evaluate the sources obtained (evaluating the sources), take careful notes (taking careful notes), write and revise the paper (writing and revising the paper), and document the sources obtained.

3) RESULTS

Challenges in Blended Learning

Blended Learning based on Transmission

Kerres and de Witt (Martínez-caro & Campuzano-bolarín, 2011) define blended learning as a combination of different instructional methodologies and delivery modalities. The type of blended learning that appears more frequently in the literature is the type that blends e-learning with other types of traditional learning such that the teaching and learning process takes place both in and outside of the classroom.

The most crucial factor to consider is that the mix incorporates the strengths of each type of learning environment while excluding the flaws. When designing a blended learning course, Osguthorpe and Graham (Martínez-caro & Campuzano-bolarín, 2011) identified several goals to aim for, including pedagogical richness (using class time to their advantage), access to knowledge (using more resources, connecting to experts, etc), social interaction (in class and online), personal agency (learner control), cost effectiveness, and ease of revision.

It is necessary to look for potential obstacles in effective design in order to discover the challenges of blended learning. Blended learning is a method of learning that combines traditional face-to-face interaction with the use of internet technology. In the actual world, creating effective mixed learning environments is quite tough. Teachers and students want sufficient time to learn new technical skills and generate well-prepared lecture notes. It is important to mention that in the age of digital literacy and the use of soft learning materials for learning, one should acquire the essential technical skills and attempt to spend more and more time learning by doing (Alam & Agarwal, 2020).

According to Graham (Alebaikan & Troudi, 2017) these challenges of blended learning issues include culture and blended learning environments, finding the correct design, and time demands. Challenges linked to blended learning are:

- Culture and blended learning environments: one of the most difficult aspects of implementing blended learning is integrating it into traditional institution cultures. The challenges that are most likely to develop concern a measure of the extension of comfort levels associated to the use of technology in education, the level of students' self-discipline, organizational and administrative support, student responsiveness, and societal norms and values.
- Finding the correct design: Blended learning's flexibility covers a variety of design needs, which is both a strength and a challenge. Blended learning necessitates an intentional approach to instructional design in order for a program to be blended in design, not merely delivery. It would be much easier to adopt blended learning if there were proven design

frameworks that could be utilized as recommendations. Another significant issue that teachers of blended courses face is creating effective and interactive digital content.

- Demand on time: according to Graham, Allen, and Ure, instructors who implement blended courses will have to spend more time developing digital content and facilitating online learning. Because of the need to modify the course, converting traditional courses to blended courses will take more instructor time than producing traditional courses. Furthermore, in blended learning environments, teachers and students often spend more time learning new techniques and skills, as well as communicating with one another. Instructors will need to alter their schedules to allow for more frequent interaction with students, who anticipate more frequent feedback in online environments than they do in face-to-face settings.
- Well integrated teamwork: "Blended learning" is defined as "every time a student learns, at least in part, at a supervised brick-and-mortar venue away from home and the rest through online delivery," according to Horn et al. Students have some control over time, place, path, and/or pace (Shailaja & Sridaran, 2014).
- Communication: It is obvious that in order to objectively determine if the adaptation is effective, a systematic strategy incorporating quantitative tools and statistical data analysis must be used. If the online content was not generated by a topic specialist, the technician or designer should be in sync and closely linked with the faculty to obtain the desired results (Shailaja & Sridaran, 2014).

Face-to-face driver, rotation, flex, online lab, self-blend, and online driver are six blended learning approaches proposed by Horn and Staker (Embi & Panah, 2014). They did, however, delete two of the six blended learning models, face-to-face and online lab, because they thought they were duplicates of other models. However, only four models are described in the article: rotation model, flex model, A La Carte model, and Enriched-Virtual model. Each model is explained in detail below (Ayob et al., 2020):

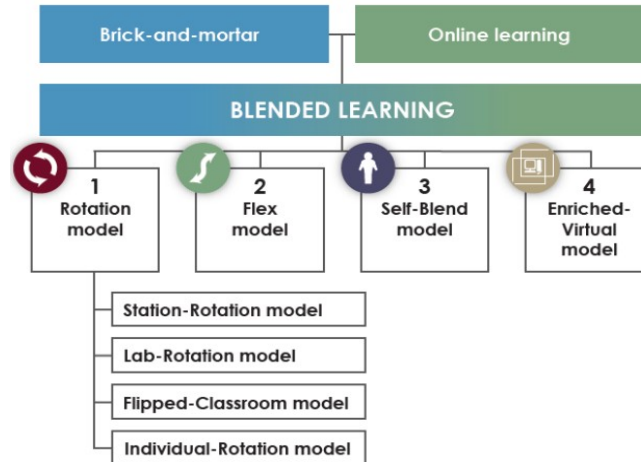


Figure 2. Categories of Blended Learning

a) Rotation Model

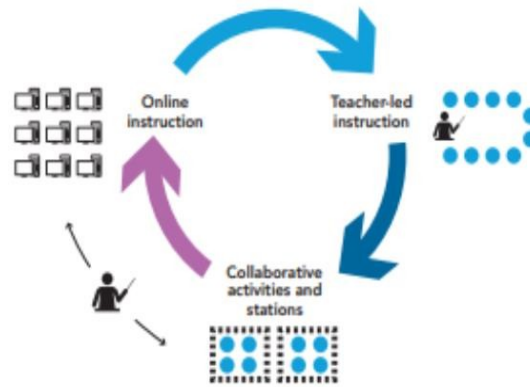


Figure 3. Rotation Model

Whole group teaching, small group teaching, peer-to-peer activities, tasks, and solo work on a computer or tablet are all examples of learning activities (Cahya Dewi et al., 2018).

A learner must go through a rotating process to learn their courses, either in a traditional or online setting. It helps the learner to study in appropriate settings and to abandon learning methods on a regular basis. Regular scheduling, a broad range of learning through contact between the student and the teacher, interactive sessions, and so on are some of the aspects of this learning (Alam & Agarwal, 2020).

b) Flex Model

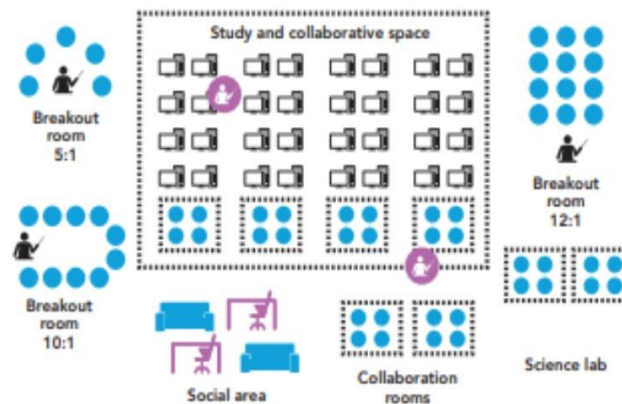


Figure 4. Flex Model

The session is self-guided and the instructional materials and instructor are provided online. While the professors stay in place, the students work independently, with lecturers and students accompanying them. This methodology allows for learning flexibility, and lecturers serve as mentors (Cahya Dewi et al., 2018). As part of Flex Learning, students direct themselves in an electronic environment where course content design and academics are active. A high level of supervision has been placed over the students' learning process, allowing them to learn at their own pace, as well as faculty support and supervision, such as small group study, individual lessons, and so on,

as well as a flexible framework as a demand of learners for completing the program and learning materials (Alam & Agarwal, 2020).

c) A La Carte Model

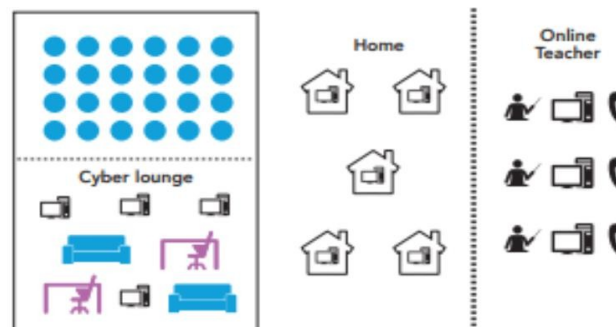


Figure 5. A La Carte Model

Students are given specific instructions via online. Lecturers serve as online teachers for students who are unable to attend classes on campus (Cahya Dewi et al., 2018). In this paradigm, a student has the option of enrolling for courses offered and registering for them online, rather than through the usual means of registration used by institutes or universities. It allows students to build or choose their optional courses based on the credits required to effectively complete those courses. When the university is unable to provide certain learning opportunities or study options, a chosen model of courses may be the best option (Alam & Agarwal, 2020).

d) Enriched Virtual Model

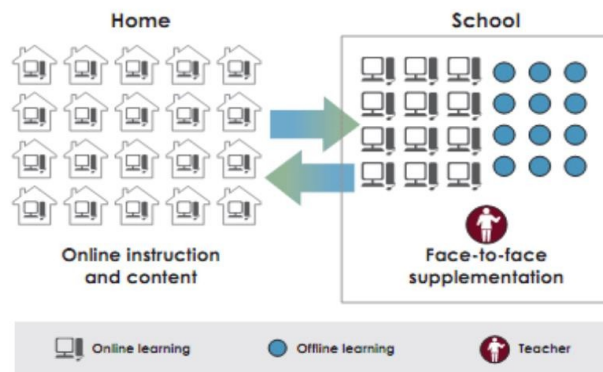


Figure 6. Enriched Virtual Model

Students are required to meet with instructors in person, but then complete their assignments online. Students may not have the opportunity to meet with their lecturers during every lecture, but there are scheduled face-to-face meetings (Cahya Dewi et al., 2018). In contrast to technology-assisted direct-to-normal approaches, this model is based on virtual learning. All forms of necessary activities have been replaced by an electronic learning environment. Reading, cross-learning, communication, and debate through technological channels are all included in this format. Aside from that, some additional workshops and supplementary lecturer/sessions on campus could be provided to complement this concept (Alam & Agarwal, 2020).

Blended Learning based on Learning Styles

Learning styles, according to Keefe (Shailaja & Sridaran, 2014) are cognitive, affective, and psychological characteristics that provide as relatively reliable indications of how students perceive, engage with, and respond to the learning environment. The cognitive, emotive, and physiological characteristics of students have gained specific attention, and learning style is widely described as individuals' intrinsic preferences for how they engage in the learning process (Hu et al., 2021).

Learning styles are not set personality traits, but rather reflect an individual's adaptable approach to learning. As a result, learning styles might alter depending on the situation, and further research in various contexts is necessary to have a better understanding of learning styles. Web-based technologies have become ingrained in people's daily lives and learning habits, removing barriers of distance and time. Online and blended learning have come to penetrate practically every element of the educational landscape, which requires rigorous scrutiny. Recent research have discovered a mixed picture of whether students in a web-based/blended learning environment had a typical preference for learning, in addition to a series of studies that commented on the application of information and communication technology in the learning process (Hu et al., 2021).

A comprehensive study examined the learning styles of K12 children in a blended learning setting using the Visual, Aural, Reading or Write, and Kinesthetic model, revealing the effect of the interaction between personal-ity, learning style, and satisfaction on educational outcomes. In the context of blended learning, a recent study highlighted the negative consequences of kinesthetic learning style, while highlighting the good effects of visual or auditory learning styles on students' academic achievement.

a) Rotation Model

The steps of the rotation model of learning are distinctive in that they urge pupils to be active both mentally and physically. Direct experience, sometimes known as "learning by doing," provides the most comprehensive and meaningful impression of the knowledge and ideas. The senses of sight, hearing, touch, smell, and taste are all involved (Made & Putra, 2020).

b) Flex Model

Online learning serves as the backbone of students' learning in flex learning. Another definition of flex model is a program in which the teacher-of-record is on-site and the teaching and content are delivered online. Students move on individually based on their requirements (Salleh et al., 2017). While the majority of the training is delivered online, the teacher-of-responsibility record's is to provide face-to-face support and to guide students through classroom activities such as small group instruction, group projects, and individual tutoring.

c) A La Carte Model

The lecturer encourages students to take on evaluation challenges that are a good fit for them (i.e., competency). Furthermore, by allowing this level of autonomy, the instructor can maximize student engagement while also clearly communicating that the responsibility for intellectual growth falls squarely on the shoulders of the students, rather than risking the student cohort becoming passive learners as a result of a perceived lack of control, absorbing (or not) delivered information from the instructor and compartmentalizing it in a way that is solely aimed at scoring well on exams (Sibold, 2016).

The A-La-Carte model illustrates and integrates face-to-face and online education. Students take a portion of their classes online to supplement what they learn in class. It should be feasible to do so in a classroom or anywhere else. Teachers can expand the area of study assets that students learn through this medium, assisting their motivation and, finally, customizing students' learning styles (Joyce et al., 2020). This concept is gaining popularity in both the educational and professional worlds since it allows students to manage their time, location, and pace while mastering their skills and knowledge.

d) Enriched Virtual Model

Enriched-Virtual model, in which content is delivered and learned online, with face-to-face encounters occurring only when necessary and as a complement. This concept begins with the creation of a totally online school, followed by the creation of a hybrid curriculum to provide students with face-to-face schooling. Attending school teaching and distance studying take up equal amounts of time (Mahmud, 2020).

The Enriched Virtual approach differs from the Flipped Classroom in that students in Enriched-Virtual programs rarely visit a brick-and-mortar campus on weekdays. Because it is a whole-school experience rather than a course-by-course model, it differs from the Self-Blend methodology. Some schools, for example, require students to meet face-to-face with teachers for their initial course meeting (of all courses) in a physical place. If they wish, they can finish the rest of their courses online as long as they maintain a minimal grade point average (e.g., "C") in the program.

Blended Learning based on Web-Support

In many ways, traditional lecture-based instruction is flawed. Ineffectiveness, passivity, and student alienation are all issues connected with this form of teaching. These pedagogical difficulties can be solved using technology and Internet-based services (Shailaja & Sridaran, 2014). Nonetheless, the difficulties that plague any information system, such as confusion, slowness in navigation, and cognitive overload, are amplified by the Internet. Internet tools can be viewed as cognitive kits, or instruments for constructing knowledge.

The following sections described blended learning based on Web-support are (Embi & Panah, 2014):

- **Linking-The Lecturer Curates:** Linking to other Webpages and Webtools is done to (1) augment the LMS's features, (2) provide access to existing resources, and (3) offer more recent and engaging learning activities. Connection to Web 2.0 technologies to facilitate real-time collaboration and cooperative work is the most common linking done by lecturers. The i-Learn LMS does not include a chat function, but it may be readily linked to etherpads and other tools like Padlet.
- **Wrapping-The Lecturer Guides:** with a profusion of open resources in the form of OER (Open Educational Resources) and MOOC (Massive Open Online Courses), lecturers can use high-quality courses to support their own research.
- **Wisc-online:** learning objects are a digital repository of web-based learning tools. The digital collection of objects was created mostly by Wisconsin Technical College System academics, while the learning objects for the online environment were created by software and multimedia developers. Currently, approximately 400 of their academic members have contributed to the creation of learning objects. Over 2500 learning items are available in the Wisc-Online digital library, which is free to teachers and students and has copyright authorization for use in any classroom or online application. A team of instructional designers, editors, technicians, and student interns creates and develops learning products. Assessments, Animations, Simulations, Case Studies, Drill and Practice, and Templates are examples of learning objects (see <https://www.wisc-online.com>) (Borba et al., 2016).
- **Khan Academy:** is a personalized learning resource for students of all ages that includes practice exercises, instructional videos, and a personalized learning dashboard that allows students to study at their own pace both inside and outside the classroom. Their math missions take students from kindergarten to calculus and use cutting-edge adaptive technology to identify strengths and learning gaps (see <https://www.khanacademy.org>) (Borba et al., 2016). Virtual learning environments (VLE)/ Learning management systems (LMS): VLE or LMS is a Web-based platform for courses of study, typically within educational institutions. Participants could be organized into groups, resources, activities, and

interactions could be presented within a course structure, different stages of assessment could be provided, participation could be reported on, and LMSs (or VLEs) could have some level of integration with other institutional systems (Borba et al., 2016). However, inept usage of LMSs has been condemned, particularly the publication of static information on an LMS. The pattern is one of course modularization and separation into separate pieces. As a result, LMS-driven models struggle to meet the diverse needs of a large number of students. According to Garca-Pealvo et al. LMS users have achieved a productivity and stability plateau, and that this stability of the LMS may act as a barrier to the introduction of innovations.

- Personal learning environments (PLE): as a notion relating to the use of technology for learning with a focus on the learner's appropriation of tools and resources a PLE could be made up of a number of subsystems, such as a desktop program and one or more web-based services, and could leverage collaborative tools, such as small groups or web services, to connect a variety of resources and systems in a single area.
- Personal learning networks: extend this framework to incorporate an informal learning network of people with whom you can connect for the goal of learning. Participants in a PLN recognize that they are networking for the express goal of active learning. As a result, a PLN is based on reciprocity and a level of trust, with one partner actively seeking value-added information for the other (Borba et al., 2016).
- Mashups: "The Frankensteining of software artefacts and data," as it's known. They describe the creation of a technological framework that allows students to create their own personal learning environments by combining web-based tools into a single-user experience, participating in collaborative activities, sharing their designs with peers, and modifying their designs to reflect their learning experiences.
- Mupples: individual and collaborative learning activities in both formal and informal contexts are generally supported by distributed web-applications and services. These PLEs would provide additional services and external learning resources to an LMS. A mupple appears technologically as a learning web, in which material is disseminated across websites and activities can easily include the usage of a variety of services provided by web-based learning applications.

Haughey & Anderson (Mahmud, 2020), Regarding the development of blended learning, it was discovered that there are three possible models for developing internet-based learning systems. The development model is as follows;

1. Web course model is an internet-based educational approach in which students and educators are fully separated and no face-to-face interaction is required. The internet is used to deliver all teaching materials, discussions, consultations, assignments, exercises, tests, and other learning activities.
2. Web-centric course model is an internet-based learning approach that blends distance learning and face-to-face instruction (conventional). While the functions are complementary, some information is supplied via the internet and some is delivered face-to-face. Educators can use this model to give students guidance on how to learn subject matter using the web that has been created. Students are also told to hunt for additional sources on relevant websites. Students and educators debate more about the discoveries of content learned through the internet in face-to-face sessions.
3. Web enhanced course model, internet utilization model to support the improvement of the quality of learning done in class, the function of the internet is to provide enrichment and communication between students and educators, fellow students, group members, or students with other resource persons. As a result, educators are expected to master the technique of finding information on the internet, guide students to find and find sites that are relevant to

learning material, present material on the web that is interesting and desirable, provide guidance and communication via the internet, and other skills.

4) DISCUSSION

This research aimed to categorize the numerous obstacles, learning styles, and web-based support that are related with blended learning. Additional work is required, however, to provide high-quality, research-based, and needs-based professional development in the efficient use of technology to mix learning in a positive and transformative direction. This study should help e-learning providers, producers, educators, and researchers come up with improved e-learning and blended learning approaches. My next project will be to create a learning model or design for implementing and evaluating blended course efficacy that takes into account budget constraints and physical space constraints. The findings of this study may pave the way for researchers and others to plan their research in this topic in the future, allowing them to delve deeper into it.

REFERENCES

- Alam, M. S., & Agarwal, J. (2020). Adopting a Blended Learning Model in Education: Opportunities and Challenges. *International Journal of Early Childhood Special Education*, 12(2), 1–7. <https://doi.org/10.9756/INT-JECSE/V12I2.201050>
- Alebaikan, R., & Troudi, S. (2017). *Blended learning in Saudi universities: challenges and perspectives*. 7769(January). <https://doi.org/10.1080/09687761003657614>
- Attard, C., & Holmes, K. (2020). An exploration of teacher and student perceptions of blended learning in four secondary mathematics classrooms. *Mathematics Education Research Journal*. <https://doi.org/https://doi.org/10.1007/s13394-020-00359-2>
- Ayob, N. F. S., Halim, N. D. A., Zulkifli, N. N., Zaid, N. M., & Mokhtar, M. (2020). Overview of blended learning: The effect of station rotation model on students' achievement. *Journal of Critical Reviews*, 7(6), 320–326. <https://doi.org/10.31838/jcr.07.06.56>
- Borba, M. C., Askar, P., Engelbrecht, J., Gadanidis, G., Llinares, S., & Sánchez, M. (2016). Blended learning, e-learning and mobile learning in mathematics education. *ZDM*. <https://doi.org/10.1007/s11858-016-0798-4>
- Cahya Dewi, K., Indah Ciptayani, P., Dwi Surjono, H., & Priyanto. (2018). Study of instructional model on blended learning in polytechnic. *Cakrawala Pendidikan*, 37(2), 270–281. <https://doi.org/10.21831/cp.v37i2.18267>
- Elmer, E. (2020). *Library Research Process*. <https://library.uaf.edu/lr101-research-process>
- Embi, M. A., & Panah, E. (2014). Blended and Flipped Learning: Case Studies in Malaysian HEIs. In *Blended & Flipped Learning: Case Studies in Malaysian HEIs*.
- Fisk, P. (2017). *Education 4.0 The Future of Learning will be Dramatically Different, in School and Throughout Life*. <http://www.thegeniusworks.com/2017/01/future-education-young-everyonetaught-together/>
- Hu, J., Peng, Y., Chen, X., & Yu, H. (2021). Differentiating the learning styles of college students in different disciplines in a college English blended learning setting. *Plos One*, 16(5), e0251545. <https://doi.org/10.1371/journal.pone.0251545>
- Joyce, C., Anekwe, & Ochuba. (2020). Investigation On The Influence Of A La Carte Model & Face To Face Learning On Students ' Performance In Phonetics Investigation On The Influence Of A La Carte Model & Face To Face Learning On Students ' Performance In Phonetics. *IOSR Journal of Research & Method in Education*, 10(2), 8–14. <https://doi.org/10.9790/7388-1002070814>
- Made, D., & Putra, D. (2020). *Station Rotation Type Blended Learning Model Against Critical Thinking Ability of Fourth Grade Students*. 4, 516–523.
- Mahmud, R. (2020). Blended Learning Model Implementation in the Normal, Pandemic, and New Normal Era. *Proceedings of the 5th Progressive and Fun Education International Conference*

- (PFEIC 2020), 479(Pfeic), 130–139. <https://www.atlantispress.com/proceedings/pfeic-20/125945140>
- Martínez-caro, E., & Campuzano-bolarín, F. (2011). *Factors affecting students' satisfaction in engineering disciplines : traditional vs . blended approaches*. 36(5), 473–483.
- OECD. (2015). Students, Computers and Learning: Making the Connection, PISA. In *OECD Publishing*. <https://doi.org/10.1787/9789264239555-en>
- Pikhart, M., & Klimova, B. (2019). Utilization of linguistic aspects of bloom's taxonomy in blended learning. *Education Sciences*, 9(3). <https://doi.org/10.3390/educsci9030235>
- Salleh, F. I. M., Baharum, H. I., & Shamsudin, S. (2017). Comparative study between flipped learning and flex model in english as second language classroom. *Advanced Science Letters*, 23(4), 2663–2666. <https://doi.org/10.1166/asl.2017.7611>
- Shailaja, J., & Sridaran, R. (2014). Taxonomy of E-learning challenges and an insight to blended learning. *Proceedings - 2014 International Conference on Intelligent Computing Applications, ICICA 2014, February*, 310–314. <https://doi.org/10.1109/ICICA.2014.70>
- Sibold, J. (2016). Learning A La Carte: A Theor-Based Tool for Maximizing Student Engagement. *Journal of College Teaching & Learning*, 13(2), 79–84. <https://doi.org/10.1080/03098267908708733>
- Suma, K., Suwindra, I. N. ., & Sujanem, R. (2020). The Effectiveness of Blended Learning in Increasing Prospective Physics Teacher Students' Learning Motivation and Problem-Solving Ability. *JPI (Jurnal Pendidikan Indonesia)*, 9(3), 436. <https://doi.org/10.23887/jpi-undiksha.v9i3.21947>