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Research Article

Evaluating The Effectiveness Of Social Media As A Supplementary Resource In Blended Learning: A Comparative Study

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ABSTRACT

Because of the exponential rise of the internet and the use of computers since the 1990s, the information era that we are now living in is characterized by a number of distinguishing characteristics. The worldwide reach of each of these entities is rapidly growing. In addition, communities are altered by proliferation. Over the course of the last several years, the area of education has undergone significant transformations, which coincide with the rapid development of technology. Parents had a difficult time motivating their children to finish their school while the pandemic was going on. There have been a number of stakeholders engaged in educational institutions that have expressed their concerns as a consequence of the transition to online mode. The first problem was that teachers were unable to conduct one-on-one interactions with the parents of the students. Furthermore, when it comes to instructing students via the internet technique, substantial training is required. The majority of users utilize social media via communicating with one another, making new friends, and sharing material with one another. On the other hand, the inclusion of social media platforms in educational settings has recently emerged as a controversial issue. The websites that are used for social networking are flexible and easy to navigate. The final consequence is that they are easier to use than other learning management systems that are currently available.

Keywords: Effectiveness, Social, Media, Supplementary, Resource, Blended, Learning

INTRODUCTION

Parents had a difficult time motivating their children to finish their school while the pandemic was going on. There have been a number of stakeholders engaged in educational institutions that have expressed their concerns as a consequence of the transition to online mode. The first problem was that teachers were unable to conduct one-on-one interactions with the parents of the students. Furthermore, when it comes to instructing students via the internet technique, substantial training is required. We have reached our third point, which is that problems with the internet connection caused disruptions in online classes. Online courses were the primary means by which individuals continued their education during the epidemic, despite the challenges that were presented. [1-3]

The transition to an online format resulted in the emergence of a number of different online platforms. Utilizing TikTok in a responsible manner has a positive influence on the level of participation shown by college students. It is also possible for students to use TikTok in order to increase their vocabulary. In addition to using TikTok, teachers also used the messaging app Discord. Since its inception, Discord has developed into a feed backing platform, serving both educational and linguistic goals. Even going so far as to utilize Facebook to improve pupils' mathematical literacy was the idea behind one piece of study. Based on the data that is currently accessible, it has been shown that online platforms have rapidly acquired popularity in online classrooms and provide students with positive results. [4-6]

The social media-supported learning paradigm and the blended learning model

New opportunities have become available as a result of the widespread use of technology, which has also had a positive impact on the institution of education. New approaches to teaching and learning are proving to be beneficial to the field of scientific education, just as they are to other fields of education. The use of the internet has become ubiquitous in every aspect of contemporary life, but it is particularly widespread in educational settings. Furthermore, rather than depending on a single technique of education, it is now essential to make effective use of the internet, education-related portals, and social media, as well as to mix a variety of learning approaches. This requirement presents a barrier to both blended learning and the strategy that makes use of social media as a complement to students' educational experiences.

As a consequence of the internet and other technological breakthroughs, there is a growing fear that the significance of conventional classroom settings may decrease. This is because the internet and other technical advancements have made available more information. E-learning platforms were developed as a result of research into the potential of this occurring, and some schools have even gone so far as to construct programs that give an education that is wholly delivered via the use of e-learning. With the passage of time, the popularity of online education has increased, and it is increasingly being deployed in combination with the delivery of conventional classroom training. This ultimately resulted in the creation of blended learning as a model for educational practices. [7-9]

Strong features of an in-person learning environment that guide interaction and communication between the instructor and students

While there are many positive aspects of blended learning, such as the fact that students are able to study whenever and wherever they choose and that they are able to receive instant feedback, corrections, and reinforcement through a web-based learning environment, there are also many positive aspects of blended learning, such as the fact that students are able to view and evaluate each other's learning products and that teachers and students are able to communicate directly with one another.

Numerous research have shed light on the advantages that may be gained by using blended learning. These benefits include, but are not limited to the following: (i) a learning environment that is more adaptable and user-friendly; (ii) higher levels of learning and achievement; (iii) knowledge retention; (iv) increased interest in and motivation for learning; (v) enhanced motivation within the course settings; (vi) interaction; and (vii) reduced costs.

Learning and teaching techniques have also seen significant changes in this century as a result of the development of digital technology, which has had an effect on the social, cultural, and economic elements of life. After 2005, social media websites such as Facebook, YouTube, and others came into existence as a consequence of a technology known as Web 2.0. This technology enabled users to connect and interact with one another, as well as to share videos and images with one another. A number of social media sites went through a significant transition, which resulted in a meteoric rise in their popularity. Due to the fact that social networks have been there for quite some time, there has been a notable increase in the amount of time that users spend on these platforms, which attract users from a diverse range of age groups.

Social media sites' effectiveness enhances education by offering blended learning opportunities.

Users are able to build public or semi-public profiles inside a rule-based system on websites that come under the umbrella term "social network" (Boyd & Ellison, 2008). These websites also allow users to discover who else they are linked to and explore their own network. The majority of users utilize social media via communicating with one another, making new friends, and sharing material with one another. On the other hand, the inclusion of social media platforms in educational settings has recently emerged as a controversial issue. [10-11]

The websites that are used for social networking are flexible and easy to navigate. The final consequence is that they are easier to use than other learning management systems that are currently available. It is possible for a big group of educators and researchers to simply establish a community in which members may communicate with one another, share resources, and gain knowledge from one another. The user experience is improved as a result of all of these features. blended learning experiences, which are made feasible by social networking sites, have the potential to bring about improvements in education and assist schools with both teaching and assessment.

There is a general consensus that blended learning and learning that is supported by social media will become more significant over the course of time. As a consequence of this, research on blended learning and social media have to be carried out with a number of concerns in mind. Taking into consideration all of these achievements, the purpose of this study is to conduct an empirical investigation into the impact that blended and social media-assisted learning have on the self-directed learning capacities and attitudes of students in the field of scientific education.

OBJECTIVES OF THE STUDY

1. Studying on social media platforms improves education since they provide options for integrated learning.
2. To do research on blended learning and the social media-supported learning paradigm.

RESEARCH METHOD

During the course of this inquiry, an informative mixed pattern was used. The gathering of quantitative data is the first step in the process of doing research using an explanation mixed-method approach. This is followed by the collecting of qualitative data, which serves to enhance the validity of the quantitative data. The use of mixed-pattern studies, which combine qualitative and quantitative research approaches, enables researchers to address many situations or environments at the same time, so enabling them to achieve a greater number of objectives. Another way to characterize it is as a strategy that combines the most beneficial aspects of quantitative and qualitative methods in such a way that they complement one another, rather than just being a simple combination of the two. [12]
Student participants in the BL and SMSL groups were asked to take part in semi-structured interviews in order to collect qualitative data. On the other hand, quantitative data was collected using a semi-experimental methodology. The research methodology that was used in the study is shown in Table 1.

Table 1. Design of Research

	Learning Model	Pre-Tests	Post-Tests
Control Group (CG)	FFL	AST, MSFLS	AST, MSFLS
Experimental Group-1 (EG1)	BL	AST, MSFLS	AST, MSFLS, SSIF
Experimental Group-2 (EG2)	SMSL	AST, MSFLS	AST, MSFLS, SSIF

As can be seen in Table 1, there were both control groups and experimental groups that were developed. For EG1, CG made use of FFL, while for EG2, they deployed SMSL.

The Study Group

A single public school provided the sample for the experiment, which consisted of seventy-four seventh graders. Considering that the study was conducted using a semi-experimental approach, the people were not selected in a random fashion. As a result, the Study Groups Selection Form was used in order to construct the CG, EG1, and EG2 classes. This form was utilized to gather information about the amount of computer usage, internet facilities, internet usage frequency, Facebook usage frequency, and YouTube usage frequency. In accordance with the principles of semi-experimental design, it is hypothesized that factors other than these have an influence on students in the control group and the experimental group that is equivalent to the impact that these variables have.
While EG1 and EG2 make extensive use of the internet, the CG group makes less frequent use of the internet than the other two groups. As a consequence of this, the courses that had the greatest levels of internet access and usage were designated with the letters EG1 and EG2, while the classes that had the lowest levels were designated with the letter CG. For the purpose of determining EG2, we examined the levels of social media usage among the groups that had the greatest levels of internet use. It was discovered that EG1 had a lower level of social media use compared to EG2 due to the fact that they had more regular access to the internet at home. The hierarchical breakdown of the categories is shown in Table 2. [13-15]

Table 2. The Groups' Distribution based on Gender

Gender	CG	EG1	EG2	Total
Female	12	14	13	39
Male	10	09	10	31
Total	22	23	23	70

Data Collection Tools

Methods that are both qualitative and quantitative For the purpose of data collection, specific devices were used.

Tools for Quantitative Data Collection:

A Multiple-Choice Examination (also known as an Assessment for Academic Success, or AST) The ability of students to demonstrate their understanding of the topic "The Systems in Our Body" has been assessed via the use of an AST that is comprised of thirty questions. When the researchers were developing the AST, they did so with the aims and anticipated objectives of the "The Systems in Our Body" section of the seventh grade science and technology lesson plan in mind. [16]

In order to assemble the questions that would be included in the AST, researchers looked at previous studies, screening examinations that were conducted by various educational websites, and exams that were administered by the Ministry of Education. During the process of preparing for the AST, a requirements table was developed, and questions were distributed in a manner that was consistent with the subtitles and the outcomes (APP. 2).

The validity of the content was assured by requesting the opinions of three science and technology educators with eight to thirteen years of experience, two professors who teach in the scientific education teacher training programs at state institutions, and an evaluation and assessment expert. Following consultation with specialists, we carried out a pilot study with thirty students from a separate class in order to guarantee that the questions we posed were appropriate from a scientific standpoint.

Assessment of the AST results that were employed in the study was accomplished by the utilization of the number of questions. The number of questions that the students answered correctly was taken into consideration while determining their grade. The academic success test offered one point for each correct answer, while a score of zero was given for any response that was either blank or erroneous. An item analysis was performed on the test data with the assistance of the SPSS 17 program. The results of this analysis included the determination of the originality and difficulty indices. Additionally, a calculation of the KR-20 value was carried out. By the time the pilot study was over, the AST had been reduced from 54 questions to 30 questions, a significant improvement. For the 30-item success test, the following metrics were judged to be appropriate: reliability (KR-20), median distinctiveness (0.392), and median difficulty (0.404). These metrics were calculated in accordance with the data collected from the students and the outcomes of the pilot success test. (MSFLS) stands for the Learning Science Motivation Scale. When compiling their results, the study team used the "MSFLS" software. This 23-item scale was developed the authors of the study. Using this 5-point Likert scale, you may express your opinion on anything from "I definitely agree" to "I definitely do not agree:1."

Starting at 23, which is the lowest possible number, the scale goes all the way up to 115, which is the highest conceivable value. After making minor modifications to the scale, it was administered to 421 students who were enrolled in the second grade of primary school students. Using this approach, a scale that consisted of 23 different components was developed. In their 2008 study, Dede and Yaman found that the scale had a reliability score of 0.80, as measured by the Cronbach Alpha. During the course of the examination, the reliability coefficient (Cronbach Alpha) of the scale was found to be 0.91, which indicates that the scale may be considered trustworthy. [17]

Data Collection

In the course of this inquiry, a total of thirty-two hours, which is equivalent to eight weeks, of practices were carried out. We administered the AST and MSFLS to each group twice: the first time was during the first week of school, which served as a pre-test, and the second time was during the last week of school, which served as a post-test. During the course of the study's execution, the time of the test administration was not taken into consideration.

Procedures for the FFL CG: As a consequence of the findings of the unit titled "The Systems in Our Body," the CG activities were carried out in a face-to-face setting in line with the constructivist technique of education. The first day of school for the CG was organized in accordance with the criteria that were presented in the textbook for the seventh grade science and technology classes. In a weekly four-period block, students went through the following processes in accordance with the 5E cycle lesson plan that was included in the teacher's book: knowledge testing and curiosity arousing, discovery, explanation, extension, and evaluation. The textbook, the student workbook, posters, and the laboratory materials were used as resources in the classroom, and various instructional strategies, including question-and-answer sessions, group projects, and problem-solving activities, were utilized. The activities for the subject that were included in the textbook and the student workbook were used by our group. At the end of each session, it was anticipated of the students that they would have prepared themselves enough for each class by completing the homework that was given to them from the student notebook and the course book. Both the assignments and their grades were discussed and graded in the subsequent class. [18-19]

Activities in the first EG1 (Blended Learning) area: In the first evaluation group (EG1), activities were carried out based on the findings of the unit titled "The Systems in Our Body." A total of four hours were spent by the students each week, with two of those hours being spent in-person and the other two hours being spent using online resources. Following the rules that were established by the science and technology program in 2005, which stressed a constructivist approach to learning that integrated conventional classroom teaching with internet resources, this was done in accordance with the standards.

DATA ANALYSIS

For the purpose of conducting the analysis of the quantitative data, the SPSS 17 program was used. During the analyses of the data, a p-value of 0.05 was regarded as statistically significant. Due to the fact that the reported meaningfulness (p) values were more than 0.05, it was clear that the pre-test data of the students in both the control group and the experimental group followed a normal distribution. In order to investigate the

data that was collected from different groups, a one-way analysis of variance (ANOVA) based on parametric testing was used. We employed the post hoc procedures of Tukey HSD and Games Howell in order to further narrow down the cause of the difference between the groups (intergroup difference).
Evaluation of the semi-structured interview forms was carried out via the use of descriptive analysis. This approach provides a summary of the data as well as an interpretation of it based on the themes that were selected earlier. There is the possibility that the structure and presentation of data might be guided by research questions or presentation standards for interview and observation questions. When performing this kind of research, the researcher responsible for conducting the interview or observation may be able to correctly reflect the opinions of the individuals they talked with by using direct quotations. Furthermore, the fundamental purpose of this particular sort of study is to provide the reader a description and interpretation of the data that has been obtained. In all, there have been four rounds of descriptive analysis performed on the replies provided by the respondents. To begin, we reviewed the responses that each student had to the questions in order to develop a thematic framework for each individual student. In the aftermath of this, comments and direct quotes were selected in line with the framework of the topic. Due to the fact that students were only allowed to offer frequency numbers and not percentages while filling out the student interview form, we were unable to perform a comprehensive evaluation. The generation of a frequency distribution was accomplished by supplying a numerical value for the number of students who answered to each subject. In order to evaluate the data, the distribution of frequencies was taken into consideration.
This research provides an explanation of how the results were obtained by providing a detailed description of the data. A large number of researchers participated in the study. This was done to ensure that the study was internally valid. The procedures of data collection and analysis were carried out by two researchers, who then compared their results independently after completing the project. Both of the researchers were able to reach a satisfactory level of consensus about the coding. A detailed description is provided of the process that must be followed in order to carry out investigations in order to establish external validity. The data that is gathered via qualitative research is shared with professionals in the area, as have pointed out. Additionally, the reliability of feedback retrieval is improved, as shown. As a consequence of this, the study was presented to a group of academics from the faculty of education, and they offered their feedback. [20]

Results

Results pertaining to the Primary Research Question

The primary research question that this study seeks to answer is whether or not seventh graders in elementary schools who participated in science and technology lessons that included blended learning, social media-supported learning, and face-to-face instruction saw a statistically significant improvement in their average AST scores between the first and second assessments between the two assessments.

Table 3. The CG and EG students' arithmetic median and standard deviation related their AST pre- and post-test points

		Pre-Test		Post-Test	
Groups	**N**	$\bar{x}$	**sd**	$\bar{x}$	**sd**
CG	23	11,707	4,703	15,791	6,291
EG1	24	12,281	5,652	20,441	5,875
EG2	24	11,481	3,947	18,081	6,210
Total	71	11,823	4,767	18,132	6,331

According to Table 3, the point average of the control group went from 11,708 on the AST pre-test to 15,792 on the post-test. This is a very significant increase. Following the completion of the examination, the average of the AST scores for the EG1 decreased from 12,28 to 20,440 overall. Prior to the examination, the average AST score for EG2 was 11,480; however, following the examination, it increased to 18,080. At the end of the experiment, the results showed that the control group saw a lesser increase in AST points compared to the EG1 and EG2 groups. This was the case both before and after the procedure. In spite of the fact that students in EG1 had the highest increase in point totals, students in EG2 also obtained decent point increases.

Table 4. Outcomes of One-way Analysis of Variance for KG and EG Students' AST Pre-Test Points

Source of Variation	Sum of squares	df	Mean square	F	p
Between groups	8,477	2	4,232	0,181	
Within groups	1650,237	70	23,241		0,833
Total	1658,715	72			

When looking at the AST data that were utilized prior to the study, there is not a statistically significant difference between the control group and the experimental group in terms of success rates (p>0.05), as seen in Table 4. As a consequence of this, it was presumed that the students in the control group and the experimental group had comparable levels of previous knowledge beforehand.

Table 5. Outcomes of One-way Analysis of Variance for CG and EG Students' AST Post-Test Points

Source of Variation	Sum of squares	df	Mean square	F	p
Between groups	264,691	2	132,346	3,528	
Within groups	2663,952	70	37,522		0,034
Total	2928,648	72			

The results of the study's post-test AST are shown in Table 5, which demonstrates that the success rates of the control group and the experimental group are substantially different from one another. On the post-study assessment, the blended learning group, the social media-assisted learning group, and the face-to-face learning group all did better than the other group. EG1, which used integrated learning, was able to surpass all other groups and gain the highest point. The performance of EG2, which used social media as a complement to in-person training, was superior to that of CG; but, it did not meet the blended learning success criteria established by EG1. The first stage in finding the origin of the cumulative difference in one-way variance across groups was to check for variance homogeneity, which was verified (Levene's test = 0.128% and p>0.05). There was a significant difference between the groups. The results of the post hoc Tukey HSD test, which was carried out on the basis of the homogeneity of variances, are shown in Table 6.

Finding

Students in seventh grade science and technology classes at the primary school level who were taught using blended learning, social media-supported learning, and face-to-face methods are the subjects of the second research question, which seeks to determine whether or not there is a significant change in the average MSFLS scores between the pre-test and post-test points.

Table 6. The CG and EG students' arithmetic median and standard deviation about their MSFLS pre- and post-test points

Pre-Test				Post-Test	
Groups	N	$\bar{x}$	sd	$\bar{x}$	sd
CG	23	89,707	16,597	90,501	14,487
EG1	24	91,121	9,746	99,243	6,133
EG2	24	89,483	17,461	95,081	11,979
Total	71	90,109	14,791	95,001	11,766

Discussion

As a consequence of this, it was seen that blended learning considerably increased academic performance as well as the desire to learn about science when compared to the conventional face-to-face training. In contrast, while the use of social media to promote learning did have a favourable impact on these outcomes, it did not substantially exceed the more conventional method of training that involves face-to-face interaction. On the other hand, blended learning and learning with the assistance of social media were both equivalent in terms of their effectiveness in terms of student motivation and academic accomplishment.

Research has been conducted on blended learning with the goal of making it more efficient and ensuring that it properly remembers the material that it teaches. The views of students indicate that blended learning has a number of advantages, including the enhancement of success, the enhancement of knowledge, the motivation of the session, and the enjoyment of the session, similar to the findings of quantitative research. According to the results, the findings that were stated in the literature are correct. The group is believed to have achieved greater and more significant success with blended learning when they utilized a comprehensive learning portal in conjunction with face-to-face learning, utilized all information, visuals, and interactive activities outside of class for homework, had the tests and homework completed within a specific time frame, continuously monitored student performance, and utilized the internet in addition to a significant amount of videos, visuals, and other elements in the lesson. [21]

According to both qualitative and quantitative data, the students who were a part of the mixed learning group were very enthusiastic about learning about science, and they also expressed that they appreciated being in this sort of environment. The findings of research also offer support to this concept. In addition, the study

repeatedly demonstrates that students are more motivated and have a better time when they are in an environment that allows for mixed learning. Students were encouraged to embrace blended learning because of its beneficial characteristics, which in turn prompted instructors to use this method in the classroom via the usage of blended learning. There are a few negatives to blended learning that are related with the online component, despite the fact that these benefits are there. Among them include, but are not limited to, recurring challenges with internet access, problems with servers, an inability to interact with the teacher, and a lack of free time. Because of these difficulties, children have a more difficult time completing tasks such as activities, exams, and assignments within the allotted time frame.
Although the group that participated in face-to-face learning had a notable increase in the number of AST post-test points, the group that received help from social media showed a large increase in the average number of success points. This suggests that social media did, in fact, contribute favorably to the performance of the students. The social networks that are used in SMPs have been shown to improve both the academic performance of students and their ability to remember the information that they have learned. While similar favorable benefits were also seen in this experiment, they did not result in a significant improvement in the patient's condition.

CONCLUSION

"Systems in Our Body" is the name of the class that the current inquiry was a component of. A single content portal was used by the blended learning study group. During a four-hour lecture, two hours were dedicated to in-person teaching, while the remaining two hours were devoted to online activities. A number of different platforms were used by the research group that was supported by social media. These sites included Facebook, Slide share, Dailymotion, Flickr, and YouTube. The present study had its limitations in the following areas: the utilization of "Systems in Our Body" as a curricular unit; the levels of computer usage; the facilities of having internet; the internet usages of both the experimental and control groups of students; and the frequencies of accessing Facebook and YouTube. We are going to assume for the sake of this study that all three groups are equally influenced by the uncontrollable circumstances, that the research participants answer the questions on the data collection forms in an honest and objective manner, and that the only difference between the two groups is the manner in which they were instructed. To guarantee that social media-assisted learning is successful, it is required to construct an educational social networking site that is comprehensive, to make efficient use of other social media technologies, and to make it easier for students to communicate and interact with their instructors. Blended learning makes use of both static and dynamic online materials; while it may be more useful to mix the two with social media platforms, blended learning is becoming more popular. Due to the fact that this research was carried out with seventh graders, it is feasible to do it with students from various grade levels and courses. A further characteristic of blended learning is that the amount of time spent in in-person sessions may vary from one student to the next.

REFERENCES

1. Muico, Earl Jones & Cabendario, Eva Mae & Gleyo, Sayra & Piolo, Matias. (2023). Social Media as a Supplemental Tool in Blended Learning. 7-13. 10.55529/jmcc.31.7.13.
2. Ali, Ashraf & Khan, Raja & Alourani, Abdullah. (2023). A Comparative Study on the Impact of Online and Blended Learning. SAGE Open. 13. 215824402311544. 10.1177/21582440231154417.
3. Han, Xiaotian. (2023). Evaluating blended learning effectiveness: an empirical study from undergraduates' perspectives using structural equation modeling. Frontiers in Psychology. 14. 10.3389/fpsyg.2023.1059282.
4. Vanichvasin, Patchara. (2018). Development of the Social-Media-based Blended Learning Course to Enhance Student Learning: A Case Study on a Social Science Course. Asian Social Science. 14. 58. 10.5539/ass.v14n9p58.
5. Hu, Jiaying & Lai, Yicheng & Yi, Xiuhua. (2024). Effectiveness of social media-assisted course on learning self-efficacy. Scientific Reports. 14. 10.1038/s41598-024-60724-0.
6. Al Musawi, Ali & Corresponding, & Bylieva, Ali & Osman, Mohamed & Ahmed, Abdelrahman & Al-Moqbali, Asma. (2023). A comparative study of social media networks among higher education students. Journal of Education and e-Learning Research. 10. 513-520. 10.20448/jeelr.v10i3.4900.
7. Ma, Long & Lee, Chei Sian. (2021). Evaluating the effectiveness of blended learning using the ARCS model. Journal of Computer Assisted Learning. 37. 10.1111/jcal.12579.
8. Tabassum, Bushra & Moin, Muhammad & Abbas, Qaisar & Kumbhar, Muhammad & Khan, Muhammad. (2024). The Impact of Blended Learning on Student Performance. Journal of Education and Social Studies. 5. 360-371. 10.52223/jess.2024.5217.
9. Lam, Thanh & Mukthar Kp, Jaheer & Lanh, Thanh & Thanh Le, Lanh & Thanh Le, Hien & Nguyen, Nam & Do, Bao. (2021). Study of Blended Learning in Higher Education and the Role of Social Media Applications With Special Reference to Vietnam. 10.4018/978-1-7998-7184-2.ch015.

10. Sarkar, Dr. (2023). ADVANTAGES AND DISADVANTAGES OF BLENDED LEARNING MODE : A COMPARATIVE STUDY. 10.5281/zenodo.10207405.
11. Bordovskaia, N. & Koshkina, Elena & Tikhomirova, Marina & Iskhakova, M.. (2023). The effectiveness of blended learning technologies in higher education: Assessment methodology. The Education and science journal. 25. 69-102. 10.17853/1994-5639-2023-7-69-102.
12. Joshi, Deepa & Zalte, Sheetal & Sridhar, & Johny K, Robin & Mahajan, Darshan. (2023). The Impact of Blended Learning on Student Engagement in the Digital Era. European Chemical Bulletin. 727-735. 10.48047/ecb/2023.12.si12.063.
13. Tong, Duong & Uyen, Bui & Ngan, Lu. (2022). The effectiveness of blended learning on students' academic achievement, self-study skills and learning attitudes: A quasi-experiment study in teaching the conventions for coordinates in the plane. Heliyon. 8. e12657. 10.1016/j.heliyon.2022.e12657.
14. Kumar, Vikas & Nanda, Pooja. (2022). Social Media as a Learning Tool: A Perspective on Formal and Informal Learning. International Journal of Educational Reform. 33. 105678792210943. 10.1177/10567879221094303.
15. Rovai, Alfred & Jordan, H.M.. (2004). Blended Learning and Sense of Community: A Comparative Analysis with Traditional and Fully Online Graduate Courses. International Review of Research in Open and Distance Learning. 5. 10.19173/irrodl.v5i2.192.
16. Bordovskaia, Nina & Koshkina, Elena & Melkaya, Lia & Tikhomirova, Marina. (2023). Criteria for Assessing the Effectiveness of Blended Learning Technologies Used at the University. Integration of Education. 27. 64-81. 10.15507/1991-9468.110.027.202301.064-081.
17. Kumar, Adarsh & Krishnamurthi, Rajalakshmi & Bhatia, Surbhi & Kaushik, Keshav & J.Ahuja, Neelu & Nayyar, Anand & Masud, Mehedi. (2021). Blended Learning Tools and Practices: A Comprehensive Analysis. IEEE Access. 9. 85151 - 85197. 10.1109/ACCESS.2021.3085844.
18. Vallée, Alexandre & Sorbets, Emmanuel & Cariou, Alain & Blacher, Jacques. (2019). Effectiveness of Blended Learning compared to Traditional Learning in Medical Education: a systematic review and meta-analysis (Preprint). Journal of Medical Internet Research. 22. 10.2196/16504.
19. Netreba, Margaryta. (2022). Effectiveness of blended learning technologies in higher educational institutions. 10.47750/jett.2022.13.03.018.
20. Anaraki, Firouz. (2018). The effectiveness of blended learning: A case study. ABAC Journal. 38. 82-93.