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A review of blended learning approach at senior secondary level schools

Charls KC[1]*, Dinesh Kumar Mishra[2]

[1] Research Scholar, Shri Krishna University, Chhatarpur, M.P., india

Email: charleskcvc@gmail.com

[2] Assistant Professor, Shri Krishna University, Chhatarpur, M.P., India

Abstract - The use of blended learning strategies in senior secondary schools is examined in this paper, with a focus on how combining conventional in-person teaching with online resources might improve student learning results. Their use and effectiveness are evaluated for a variety of blended learning models, including Khan's Octagonal Framework and the K–12 models. The study also explores the psychological effects of blended learning, emphasizing how it might lower anxiety and promote positive attitudes about biology and other scientific courses. By examining important research and frameworks, the study draws attention to the advantages and disadvantages of this strategy and argues for its wider use in contemporary educational systems.

Keywords: Blended Learning, Strategies, Strategies, Teaching, Biology.

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INTRODUCTION

When our species first emerged, we had no idea what any of the natural world had to offer. It was at this time that we began to glean knowledge from the natural world. We learned to persevere in the face of adversity from Mother Nature. They had to fight off wild creatures and destroy the environment at the same time. They began developing their brains at a rapid pace and improved their adaptive capacity as a consequence of their experiences in a constantly changing environment. Individuals' efforts to stay alive; as a species, humans adapt to the natural world by following its rules. Along the way, they saw natural disasters and other phenomena that piqued their curiosity and eventually gave rise to science. This is where they learnt the most from mother nature. From the invention of the wheel to the development of AI, science has taken us on a multi-faceted journey. We learnt about the Vedic education strategy throughout the Vedic time, and it was subsequently expanded upon in Gurukulam. The modern purpose of K-12 institutions, colleges, and universities is to educate future generations and help them become productive members of society. [1]

Personal development and maturation take place naturally and continuously throughout the educational process. The process really helps shape people into their unique selves while also making their lives more convenient, comfortable, culturally specific, and polite. The two most crucial aspects of education are learning and teaching. Acquiring information is the ultimate purpose of education, and this can only be achieved via a well-designed system that is time-bound, needs-based, and goal-oriented. Better and more meaningful lives will be provided to the country and its people as a result of this. A key component of the education sector should include educational technology, according to the National Policy of Education (1986). In 2020, the Indian government unveiled its new national education policy. Through this education strategy, the Ministry of Human Resource Development (HRD) said that instructional technology should get particular attention. In universities with a wide range of academic programmes.

Propose a Bachelor of Education (B.Ed.) degree programme that spans four years combined They may now provide high-quality B.Ed. programmes via blended learning thanks to their certification in open and remote learning. Blended learning in part-time special education courses is becoming the norm. Blended learning has the potential to speed up activity-based and experiential learning while simultaneously covering the social, emotional, and psychomotor domains of learning; thus, all educational institutions with high-quality online resources and an open or distance learning model should switch to this approach. A focus on fostering digital literacy has been made. Both traditional

classroom instruction and the ability to use technology effectively are emphasised in the national strategy for education 2020 as critical to a child's holistic development. So, to get around both issues, blended mode is the way to go. [2]

What we call "blended learning" combines the best features of both online and traditional interactive learning environments. Blended learning techniques were defined by Graham (2013) as an approach to education that makes use of online delivery of some but not all course material in order to cut down on classroom time wasting. "The combining of the two different education models, traditional face to face learning and distance learning" was how Graham (2006) defined blended learning. The term "blended learning" may refer to a number of different approaches to education that combine face-to-face classroom time with online resources, use many learning theories, techniques, and tactics in a single context, and ultimately improve student learning.

Blended learning combines online and offline components to provide a stable and effective learning environment that strikes a good balance between open communication and limitless access. The first step in developing a well-balanced platform is the strategy, which must take into account the platform's requirements, aims, and objectives; the second step, operational planning, must address non-institutional items such as the availability of internet, an evaluation tool suite, and necessary resources. The findings of this study highlight the need for more research into the relationship between blended learning and student outcomes such as satisfaction, self-efficacy, accomplishment, and so on. [3]

LEARNING VARIOUS BLENDED LEARNING MODELS

There are different models of blended learning evolved at different times. By the progression of time the methods and practice of blended learning increasing day by day. Many scientists used and proposed many models for correct implementation of blended learning strategies. Some of them are as follows:

- **Khan's Octagonal Framework (Khan, 2005)**

Of all the blended learning frameworks, Khan's Octagonal is the most well-known. Education in general, vocational training, and secondary school may all make good use of it. Eight separate dimensions make it up. Ethical, managerial, instructional, technical, interface design, assessment, and support for institutional resources are some of these. The institutional component encompasses a wide range of concerns, such as infrastructure, administration, and student services, all of which may need assistance with the e-learning process. Management: This aspect addresses the management section that is responsible for the upkeep and quality assurance of the e-learning environment. Regarding the technological aspects of online education, the "technology dimension" explains the historical context of the necessary infrastructure. [4]

This section covers matters pertaining to technology, such as planning, hardware, software, etc. The pedagogical dimension addresses the learning and sewing sections. Included in this category are analyses of content, goals, needs, media, learning methods, and organisational targets, as well as analyses of study designs, media analytics, and learning techniques. There are a variety of social, political, cultural, geographical, and legal concerns surrounding e-learning that fall under the ethical component. These problems have the potential to impact the teaching and learning process. The creation of an appropriate interface is a significant obstacle to effective online education. Under this dimension you may find things like learning programme loops and strategies, page and website designs, content incorporation, reachability, usability, testing of planned interfaces, and more. Help with resources: This metric accounts for the upkeep and necessary technical assistance provided to teachers and students so that the programme can function correctly. The removal of obstacles helps to keep the learning process going forward. In this section, we evaluate the instructors, the interface, and the students.[5]

- **K-12 Models of Blended Learning**

Rotation, flex, online lab, self-blend, online driver, and face-to-face driver are the six models of hybrid learning presented. The models were created in the following way when this notion was first discovered in 2009:

  - As a first step, pupils cycle between different learning modalities in the rotation. In this setting, students work in small groups of three or four and get instruction from a variety of human and digital resources on a rotating basis. This method is very efficient since it allows students to simultaneously get guidance from both their mentor or instructor and computer-based programmes.

  - In flex mode, the most of the regulating is done by the computer; in this mode, the instructor controls and supervises the class. Students work independently on computers under the guidance of instructors, who are available to answer questions as they arise.

  - With A La Carte, you can have a healthy online experience with a live teacher. There is complete oversight of this process on the internet. Online courses that have already been designed make this possible.

- Made better In the virtual approach, students and teachers meet virtually for individual sessions. With the guidance of the instructor, students are free to finish their work, and they also have the chance to work on their own assignments.

- The most important function is played by the instructor in face-to-face drivers. With the use of digital tools, he or she independently drives class management and lessons.

- Labs include delivering the whole curriculum using an online platform and a pre-established lab.

- The learner may speed up their learning process by balancing online and traditional methods of instruction; this is called "self-blending."

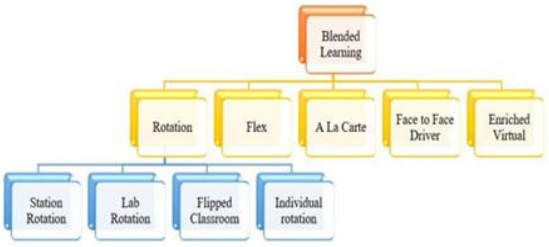

Figure 1: Blended Learning Model

BLENDED LEARNING GUIDE

Bailey, Schneider, and Ark (2013) developed this hybrid learning paradigm. Every area of schooling may benefit from this model's promotion of digital learning framework. A successful environment is the result of four steps: preparation, execution, evaluation, and enhancement.[6]

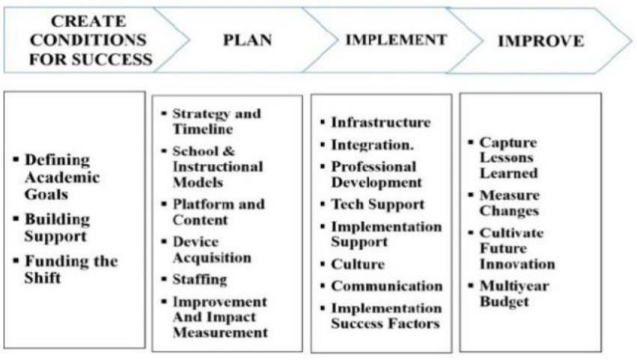

Figure 2: Blended Learning guide

Phases one through four make up the third digital learning framework guide.

The first step, "create an atmosphere for success," entails a number of tasks, such as orienting the authority towards goals, developing a significant support system, allocating funds, monitoring institutional infrastructure, and developing research objectives.

In the second stage, known as "planning," you lay out your educational goals, methods, and timeline. Instructional strategy development and planning, various learning models, study platform, content creation and analysis, device adequacy, efficient staff recruitment, a system for spontaneous and continuous feedback, and a system for measuring overall impact and improvement are all part of it.

Launching and maintaining the programme constitute the third step of implementation. To ensure the course's utmost success, it encompasses improving infrastructure, enhancing instructor professional development, providing need-based follow-up, and gradually expanding the course contents while maintaining an eye on social, ethical, and cultural aspects.

Enhancement constitutes the last stage. Incorporating novel ideas as needed into the course, recording previously taught lessons, monitoring people's learning results, and using multi-layer budgeting are all part of it. [7]

FEAR OF THE BIOLOGICAL SCIENCES

Anxiety is a common mental health issue among students. Some of the things that might make a student anxious include: bad grades, lack of regularity in their work, difficulty keeping up with their studies, bullying, ragging, intense peer competitiveness, pressure from parents, unrealistic expectations of their results, and misalignment with their peer group. In their 2014 study, Aldalalah and Gesaymeh used anxiety level and locus of control as independent factors. Anxiety was categorised into three levels: low, moderate, and high, and locus of control was further subdivided into internal and external components. The study's dependent variables are the strengths and weaknesses of blended learning methodologies. Blended learning compatibilities, such as knowledge and technological advancement, and blended learning implementation challenges were better handled by students having an internal locus of control compared to those with an external locus of control. pupils who reported intermediate anxiety levels outperformed those with low or high levels of anxiety, as well as pupils with both low and high levels of anxiety.

Dependant factors. Additionally, the research found that students with blended learning issues did not vary in terms of anxiety levels. When it comes to biological performance, Cimen and Yilmaz (2015) identified anxiety and self-efficacy as the two most influential variables. Anxieties about biology class was one of the goals of this research, which aimed to quantify the problem according to gender, grade, interest, nugatory experience, and instructors' pedagogical stance. They used analysis of variance and Pearson correlation to analyse statistical variables, and they developed a Biology anxiety

scale to gather data. They came to the conclusion that biology anxiety was significantly predicted by both an interest in biology and a bad past experience. In order to alleviate students' fears about biology, they advocated for school-wide initiatives to study the correlation between anxiety and self-efficacy. The purpose of this research is to determine if blended learning methodologies are effective in lowering students' achievement and test anxiety. Designed a study to assess the impact of blended learning programmes on anxiety levels among students enrolled in second-year journalism courses. The research is an empirical one. Research was conducted via the use of interviews. Following the conclusion of the result computation, the researcher discovered that second-year journalism students' worry is the primary obstacle to the adoption of blended programmes. Success and enhanced performance in a mixed programme may be achieved via anxiety reduction. [8]

A programme for reducing anxiety in biology via integrated learning

Students' anxiety levels have a detrimental impact on their academic performance and quality. Students' worry might hinder their academic performance, according to their findings. Students in a beginning biology course reported symptoms of social anxiety, exam anxiety, anxiety in the classroom, and communication anxiety. The study's findings reveal that biology classes are more stressful for female students, and that many of those students withdraw from the programme before the semester ends. Not only that, but this groundbreaking research shows that even a little bit of nervousness may lead to success.

Contribute to the academic performance of certain pupils. Even if there are a lot of studies in biology, studied the timing of the corona epidemic, when blended learning was widely implemented in many Indian schools. The purpose of this research is to determine whether or not blended learning helps students feel less anxious. According to the results, students are more interested in attending scientific classes on hybrid platforms than social science classes. Blended learning platforms are preferred by over 73% of students, and the majority of those students report that they have lessened their academic anxiety as a result.

Perspective on Biology

One of the positive psychological variables is attitude. A good attitude towards biology is the development of a favourable impression of the biological sciences. Science has an important role in people's daily lives. Science is an integral part of everyone's everyday lives. In light of this, encouraging a love of learning about science in young minds is crucial. In contrast, discovered that, when compared to blended or traditional courses, online courses are superior in fostering favourable views towards English. In their 2012 Iranian research, Behjat, Yamini, and Bagheri contrasted traditional classroom settings with those that used blended learning. In an experimental investigation, they assessed the pupils' attitude and reading comprehension. In terms of encouraging optimistic outlooks, they discovered that traditional classroom settings fared better than hybrid ones. The results of this research also show that this method improves instructors' and students' attitudes towards science. The impact of a blended learning programme on students' perceptions of the English language at the University of Bisha in Saudi Arabia. One hundred thirty-three students participated in a survey that measured their attitudes towards English and reported an improvement. However, it was also shown that students' positive attitudes improved as a result of their learning experience, self-assurance, enthusiasm, eagerness, and motivation. A more positive outlook on the English language is another significant impact of instructors. [9]

Simultaneously, they get a fresh perspective on course material, human resources enhance it, a student-centered strategy is used, knowledge is built, and instructors undergo professional development. Because it is so useful for formative assessment, it should be used in schools. Therefore, the purpose of this research is to determine if blended learning methodologies may influence students' attitudes about biology for the better.

Boosting interest in biology via the use of mixed learning

Several scholars before us have argued that, in order to improve students' attitudes towards the subject, biology classroom practices need to be rethought and revised. Students' attitudes towards biology are the most important component influencing their proficiency in learning biological ideas, according to research. They came to the conclusion that one's outlook on values and motivation has the greatest impact on the development of biological concepts. Students have a strong desire to learn and a positive outlook on biology when they study the subject at the secondary level.

Based on research with high school biology ninth graders, Blended learning is more successful than traditional methods in fostering favourable attitudes towards the biological sciences. Blended learning was determined to be efficient in fostering positive attitudes towards mathematics when its efficacy in an introductory mathematics course. Ninth grade biology students to determine the impact of individual vs. cooperative testing on students' academic performance, interest in science, and time spent studying in a flipped classroom. A more positive outlook on biology and increased interest in science were both fostered via blended learning. When both the instructor and the students are able to use technology to their advantage, the learning experience becomes more engaging and personalised. [10]

Nerves and Perspective on Biology in a Blended Learning Environment

Thorough literature reviews were carried out while the current research was being conceptualised. The purpose of the literature study was to identify the factors that influence the outlook and performance of future educators in blended learning, and one of the findings was an article. Flex and self-blending are used to this research endeavour. Strategies were used. After being exposed to blended learning approaches, the posttest group showed higher achievement test scores and a more positive attitude towards the mixed learning environment.

Demonstrated the use of blended learning interventions to assess traits including anxiety, motivation, confidence, and passion among students. Blended learning strategies have consistently demonstrated positive results, with students reporting less anxiety as a result. [11]

Arabian Gulf University examined the effects of a mixed-methods approach on certain learning outcomes related to medical vocabulary instruction. The purpose of the research was to determine if the proposed method had any effect on pre-med students' performance, attitudes towards the English language, and level of satisfaction with the unit. In terms of performance and outlook on the English language, the control group and the experimental group did not vary significantly. Results also demonstrated that, across three aspects, experimental group participants were very satisfied with the online unit, while moderate satisfaction was reported across one. Although students reported high levels of satisfaction with the online course, little vocabulary increase was attributed to a lack of administrative support. [12]

CONCLUSION

A revolutionary approach to education, blended learning skillfully blends conventional and digital approaches to meet the demands of a wide range of learners. Its potential to promote positive attitudes, lessen anxiety, and increase involvement in scientific education is highlighted in this study. Even if a number of models and tactics have shown promise, the results emphasize the need of strong implementation methods, sufficient infrastructure, and continuous assistance for teachers and students. Future studies should concentrate on resolving blended learning's practical issues in order to maximize its effect and incorporation into the educational system.

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Corresponding Author

Charls KC*

Research Scholar, Shri Krishna University, Chhatarpur, M.P., india

Email: charleskcvc@gmail.com