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Evaluating the Effectiveness of the Blended Learning Approach for Enriching Critical Thinking and Problem Solving in Undergraduate Students

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Abstract

Blended Learning is an advanced and pioneering approach that transforms the teaching and learning dealing with technology and creates a more productive and cooperative setting. Current study inspects the effectiveness of the Blended Learning approach for undergraduate students. For the purpose of the study a comparative study between the traditional teaching learning approach and the Blended Learning approach has been adopted. The purpose of this study is to provide a clear idea about transformative potential of this approach in the context due to challenges faced in higher education. A quasi-experimental research design was adopted. 120 students were selected and selected students were divided into two groups (experimental and control groups). Firstly, the experimental group was getting treatment as taught Blended Learning approach and control group students didn't received any kind of experimental training except traditional instruction. Pre-test and Post-test data was collected and analysed using statistical techniques. Results reviled that improvement in the academic performance for experimental group those who get the Blended Learning approach. It was recommended that the inclusion of the Blended Learning approach in education subjects may help the students for better academic performance and it will be very much beneficial for faculty members if they will get various faculty development programs for its implementation.

Keywords: Blended Learning, Undergraduate Student, Teaching and Learning, Academic Performance**.**

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Introduction

Presently education system is move through a transitional phase. It explores to respond to quick expansion and the growing demand for students active learning. Educational institutions are also adopting new technologies and innovative teaching-learning strategies. These strategies aim to provide quality education for all stakeholders. However, due to limited budgets, infrastructure, and the continued importance of face-to-face interaction for encouraging meaningful learning, traditional teaching methods are important. So, both traditional and ICT-supported teaching-learning approaches are used together and this system also influenced learners' perceptions. Blended learning method preference reflects a learning environment where students appreciate direct guidance from teachers. It also recognizing the role of technology for promoting critical thinking and problem-solving skills. ICT-supported knowledge encourages students to analyse information, investigate multiple perspectives, and apply knowledge to real-life situations, whereas traditional classroom supports interaction supports discussion, reflection, and instant feedback. Altogether these approaches generate a great chance for learners to develop higher-order thinking skills (HOT) essential for academic success and lifelong learning.

Blended Learning is a learning technique where many transmittals mode were being used with the aims of optimizing the learning result and outflow of program delivery. The term "Blended learning" is being frequently used for academic as well as corporate circles. The most significant developments of the 21st century is Blended learning in terms of teaching learning process. This approach incorporates and combines the strengths of face-to-face and online learning system.

The ICT-supported teaching and learning process is a very good choice for reduction of pedagogical errors, quality education, increasing student exposures, and aligning their knowledge with current technological advancements and globalization. This strategy gives the teaching learning process a new dimension, introduces students to a wide pool of knowledge, and opens countless opportunities towards learn, unlearn, and relearn. Long ago Swami Vivekananda truly said that schools should reach out to people if they cannot reach

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them. The same is true of ICT-supported learning.

The term critical comes from the Greek word Kritios meaning able to judge. Critical thinking is a kind of thinking in which individuals will be able to question, analyse, interpret, evaluate and make a judgement about what you read, hear and express your emotions.

In another hand Problem solving skills refer to an individual's capacity to engage in cognitive processing to understand and resolve situations where a method or solution is not immediately obvious.

Objectives of the study:

The objectives of the present study are the following:

- To evaluate the effectiveness of blended learning for teaching education in terms of achievement.
- To compare the traditional teaching method and Blended learning approach.

Hypothesis of the study:

1. The hypothesis is set as no significant change will occur due to the blended learning approach.
2. It was expected that there would be no significant difference in academic achievement.

Research methodology:

For this study, a quasi-experimental method was used to evaluate the effectiveness of blended learning method in improving critical thinking and problem-solving skills among undergraduate students. Selected subjects were equally divided into two groups: control group and an experimental group. The control group has got traditional teaching method, and the experimental group received blended learning approach that integrated face-to-face and technology-mediated learning experiences.

Sampling: For the present study, 120 (one hundred and twenty) undergraduate standard students were selected from three government-undertaken colleges of North 24 Parganas district, West Bengal. Where students were selected from each college who have opted education subject one of the elective subjects.

Tools and Techniques: For the purpose of the study, two tools are used. Firstly, a Blended learning approach was prepared based on lesson plan for teaching. Secondly, an achievement test was prepared by the researchers in consider with Education for 20 marks. Pre-test and post-test data were collected to measure students 'achievement

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before and after the teaching. For data analysis, mean, standard deviation (S.D.) and t-test were used.

Data Analysis and Interpretation:

Table 1

Effectiveness of Blended learning approach on achievement in Education

Group	Test	N	Mean	SD	t-value
Experimental Group	Pre-test	60	45.20	6.80	18.74
	Post-test	60	68.90	7.20	

Table 1 shows that the obtained t-value is 18.74; the analysis shows that the Blended Learning approach produced a highly significant and increases academic achievement. The post-test mean is higher than the pre-test means, and its prediction about the benefits of blended learning approaches. T-test result shows that the computed t-value (t=18.74, Df=59) is higher than the t-value at the 0.01 level. Therefore, the difference between pre-test and post-test mean scores is statistically significant.

Table 2

Pre-test Comparison between the Experimental group and Control group

Group	N	Mean	SD
Control Group	60	46.80	6.90
Experimental Group	60	47.10	7.10

Df = 59, t-value = 0.23

Table no 2 shows that the pre-test mean of the experimental group (m= 47.10, SD= 7.10) and the control group (m= 46.80, SD= 6.90) did not show significant differences. groups were academically equivalent at beginning.

Table 3

Post-test Comparison for Experimental group and Control

Group	N	Mean	SD	t-value
Experimental Group (blended learning)	60	74.60	6.80	10.31
Control Group (traditional teaching)	60	61.40	7.20	

T-test result also suggesting similar result (t value = 0.23). This confirms that both Table 3 shows that mean and SD value for experimental group is m=74.60, SD=6.80

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and control group is m=61.40, SD=7.20. This shows that the Blended Learning approach outperformed to the traditional teaching method. The computed t-value of 10.31 exceeds the critical t-value at 0.01 level. This shows that statistically significant difference in academic achievement between the two groups and Experimental group is demonstrated better academic achievement in comparison with the control group.

Findings of the study:

The conclusions were made after a thorough examination and interpretation. These are:

1. Blended learning approach has a considerable influence on students' academic achievement.

2. Data analysis confirms that both the experimental and control group initially performed similarly, but whenever Blended learning approach was exposed, differences were shown clearly. In this regard Blended learning approach is more effective than the traditional teaching method in enhancing academic achievement.

Conclusion:

Blended learning, as hybrid instructional approach, continuously evolving with developing age of digital technology and shift in learning framework. Future world is expecting to focus on the seamless assimilation with emerging technologies such as artificial intelligence, augmented and virtual reality and adaptive learning system. These approaches have the capability to create more personalized, mutual and energetic teaching learning environment that provide facilities to diver's student needs. Here are some key scopes to watch:

Application of AI: AI is expected to revolutionise blended learning by providing a more personalised and adaptive learning experience. AI can analyse student performance, predict learning needs and modify educational content to individual preferences.

AR and VR experiences: virtual realities and augmented realities allow students to explore experiential learning opportunities that also may go beyond traditional methods, which can learning more engaging and enjoyable.

Data analytics: Various data analysis tools help to identify trends and patterns. This may enable educators to track the performance of students, and by understanding students' challenges and

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needs. In this regard, institutions can also provide more facilities and support.

Focus on learning throughout life: Blended learning offers courses and training programs that help professionals acquire new skills and refine them, and learners can pursue additional certifications, qualifications and courses that align with their career advancement.

Educationalists and teachers should encourage students to be creative, so that students can think critically and develop problem solving skill. To facilitate this transition, teachers should arrange more faculty development programme and seminars and orientation programme focused on the blended learning approach.

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