



# Effectiveness of Blended learning approach on learning outcomes and Meta cognitive skills in Geography between Secondary school learners.

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## Abstract :

Blended Education is a cohesive enlightening approach that utilizes the gains of autonomous online learning alongside engaging live classrooms facilitated by teachers. Within blended learning, both synchronous and asynchronous learning components are combined, proving to be effective for students from elementary to postgraduate levels when online and offline teaching methods are utilized together. **Objective:** to examine the varying levels of metacognitive skills—high, average, and low—among students in relation to their academic performance in geography. **Methodology:** The researcher used a purposive sampling method to choose 80 students, applying a true experimental study design along with inferential analysis, correlation analysis, specifically employing statistical techniques including t-value, R-value computations. **Results:** The outcomes indicate a numerical change in the implied scores of blended education in comparison to traditional education, as well as in and relating to high, average, and low metacognitive skills in geography between students in the 8th standard blended learning group and those in the traditional method group. **Findings:** In the blended learning approach-EG, the outcome from both the pretest and posttest indicated a significant  $p >$  value (0.000) for high average metacognition scores, a significant  $p >$  value (0.000) for average metacognition mean scores, and a significant  $p >$  value (0.010) for low metacognition mean scores.

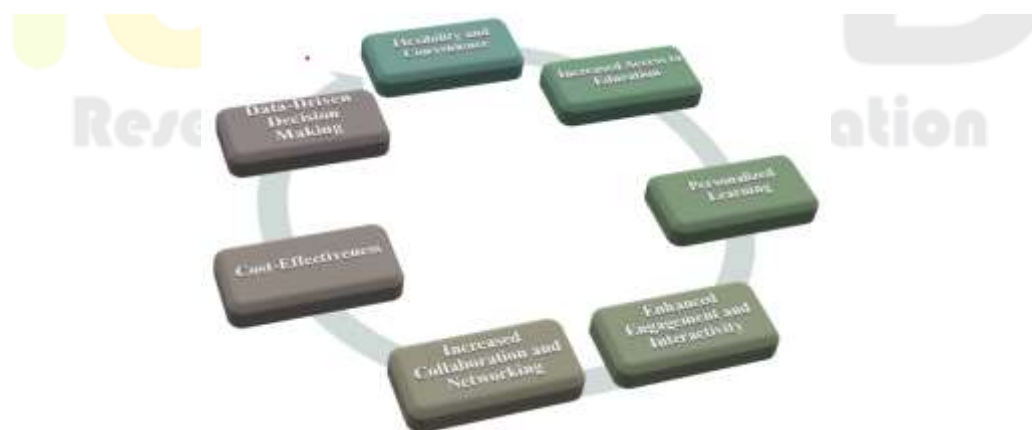
**Key words:** Blended learning Approach, Academic achievement in geography, Meta-cognitive skills, Synchronous and Asynchronous.

## Introduction

Today's learners, referred to as the Z-generation or digital natives, are the initial group to be raised with advanced technologies. They use computers, video games, and other digital devices daily. College graduates now read for under 5,000 hours but engage in video gaming for more than 10,000 hours and watch TV for about 20,000 hours. With such a heavy reliance on digital tools, school policy makers must update education methods to better serve these new generations(Ceylan & Elitok Kesici, 2017). This study examines how modern educational methods, particularly web-assisted virtual classrooms and mixed education,compare to traditional face-to-face instruction in geography(Kumar, 2010). It aims to understand their effects on students' accomplishment and perceptions regarding the subject (Widjaja & Aslan, 2022). Despite increased research in geography education, there is still limited implementation in the country(K, 2022). Developing new programs and teaching methods is crucial for students' geographic skills and the country's future(Dikmenli & Ünaldi, 2013).

Blended Learning combines different ways of learning and is also called Hybrid Learning, Hybrid Instruction, Technology-enhanced instruction, and Web-assisted instruction(Mitee & Obaitan, 2015). It mixes different teaching methods to create a flexible and self-paced learning environment(Almarzuqi, 2024). This approach provides quick feedback and uses both technology and face-to-face learning to improve students' experiences and maximize their potential(Sharma et al., 2022). Teachers' instructional approaches are a key focus for researchers(Gupta, 2020; Josephine, 2016). This is important because these methods can be adjusted to create positive changes in students' learning(Anayochukwu & Chinelo, 2021).

Blended learning is currently implemented in the education sector; it serves as a virtual resource-based learning platform. Resources can be accessed via the internet, allowing for a student-centric education center(Kaur, 2023; Monicka, 2021). They are learning through multimedia platforms. It supports self-learning for individuals of all types of students.(Ranjan, 2020).Blended learning pertains to both synchronous and asynchronous learning, making it essential as illustrated in figure 1.1 Blended learning serves as a component for student facilitators(Egara & Mosimege, 2024; Mitee & Obaitan, 2015). It assists students in personalized learning, individual learning; students can utilize digital tools across various subjects to learn for all types of students.(Rashid, 2023) .



**1.1 Blended learning benefit**

## Effects of blended education on learner's academic performance and other factors:

Instructors carried out experimental or quasi-experimental studies to evaluate the effectiveness of blended learning (BL). An Inquiry into Students' Metacognition and Learning Achievement (Indriyanti et al., 2020) View of Learning and Teaching Strategy in Geography (Widjaja & Aslan, 2022), achievement and retention (Egara & Mosimege, 2024) environment and the application of virtual class (Dikmenli & Ünaldi, 2013) Acquisition of Geography Skills for the Eleventh Level (Ortega-Ruipérez, 2022) Professional Development of Physics Teachers in an Evidence-Based (Berger et al., 2008) (Olufunke, 2018), Teaching for Better Learning (Moore & Gilmartin, 2010) self-study skills and learning attitudes (Tong et al., 2022), Student Attitudes Towards Geography Course and Their Critical Thinking Dispositions and Levels (Korkmaz & Karakuş, 2009), The strategies that integrate SRL can be cognitive, metacognitive, and socio-emotional, and different theoretical models underline the importance of each of the strategies (Ortega-Ruipérez, 2022), Scientific Attitude and Self-Regulated Learning (Shikha, 2024), Physical Science (Josephine, 2016), learning chemistry periodic (Sripriya, 2022), Effectiveness of e-learning (Monicka, 2021), Flipped Learning (R, 2020). educational objectives (K, 2022).

## The conceptual framework:

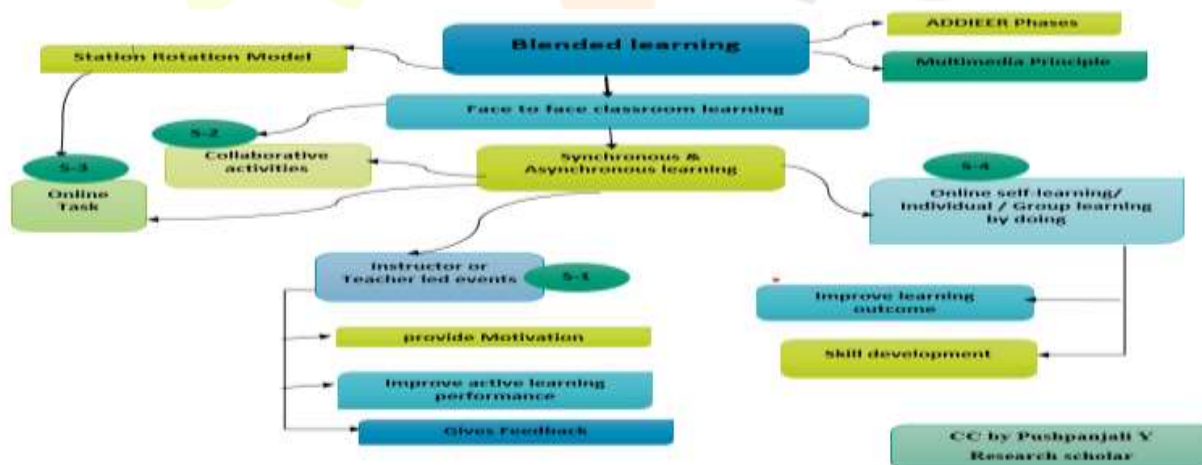


Figure 1.2 blended learning conceptual framework.

The diagram illustrates a Conceptual Framework for Blended Learning, merging conventional face-to-face education with digital learning approaches (Anil, 2023). It emphasizes essential elements such as the Station Rotation Model, ADDIEER Phases, and the Multimedia Principle to improve learning experiences (Nnamani, 2023). The framework incorporates both synchronous and asynchronous learning, supported by teacher-led activities (S-1), group work (S-2), online assignments (S-3), and independent study techniques (S-4) (Dikmenli & Ünaldi, 2013). These components enhance motivation, promote active learning engagement, and provide feedback,

ultimately resulting in better learning outcomes and skill acquisition (Banados, 2006; Ceylan & Elitok Kesici, 2017).

### Objectives:

1. To compare the high, average & low level of students' Metacognitive skills with respect to academic accomplishment in geography.
2. To determine the significant relationship between academic accomplishment in geography and metacognitive skills taught via combined learning and conventional technique.

### Hypotheses:

Based on the aforementioned objective number 2, the subsequent hypotheses have been created.

H<sub>a</sub> 1 There will be a notable distinction amongst students with great, normal, and slight metacognition within the blended learning group (EG).

H<sub>a</sub> 2 There will be a notable distinction amongst students with great, normal, and slight metacognition within the conventional group (CG).

H<sub>a</sub> 3 There will be a notable positive association between outcomes accomplishment in geography and metacognitive skills in blended learning group (EG).

H<sub>a</sub> 4 There will be a notable positive association between outcomes accomplishment in geography and metacognitive skills in conventional method (CG).

### Method and Procedure:

The study involved 80 eighth-grade students from a Government High school Bandihatti C.B. Ballari, divided into two groups of 40 (20 boys and 20 girls in each group). A pre-test was given to both groups on academic achievement in geography. The experimental group received a 50-day intervention focused on metacognitive skills, although the controller collection arranged not accept whichever intervention. Later the involvement, a post-test remained performed towards assess metacognitive skills in both groups, and the outcomes were assessed utilizing a t-value And R-value.

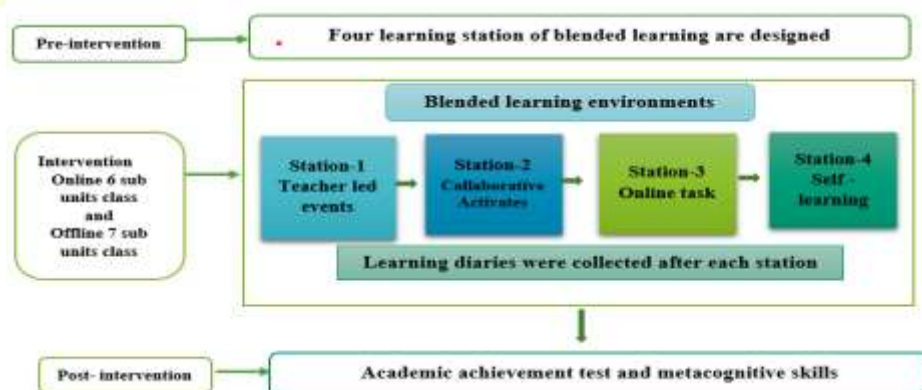


Figure 1.3 blended learning design

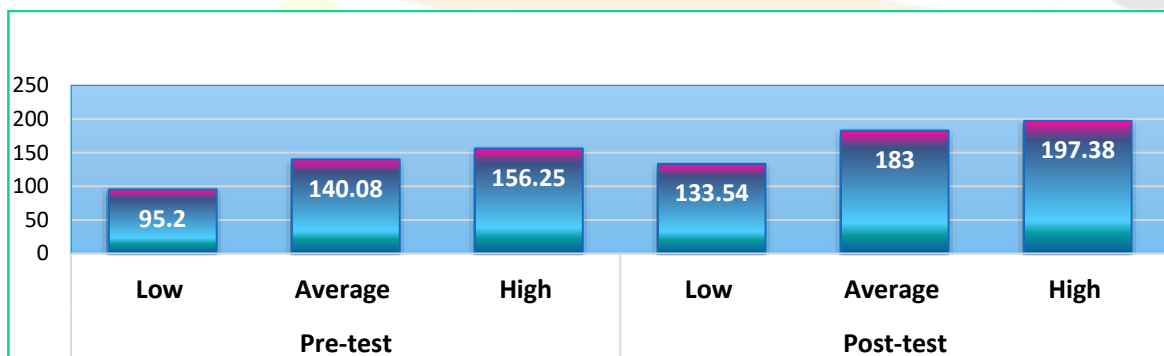
## Results and discussion :

1.To compare the high, average & low level of students Metacognitive skills with respect to academic achievement in geography.

**H<sub>a</sub> 1:** There is a notable distinction amongst students with great, normal, and slight metacognition within the blended learning group (EG).

**Table 1 shows differences in Mean Pre and Post test scores of students having great, normal, and slight Metacognitive skill among Blended learning group (EG).**

Meta cognition collection	Exam	Experimental group ( Blended learning Group)						Hypotheses supported
		Sample size	Average	SD	df	t- worth	p- worth	
High /Great meta cognition	Pre	12	156.25	7.990	11	8.500	0.000	Yes
	Post	13	197.38	12.238				
Average/Normal meta cognition	Pre	13	140.08	3.378	12	26.901	0.000	Yes
	Post	14	183.00	4.151				
Low/slight meta cognition	Pre	15	95.20	34.763	12	2.836	0.015	Yes
	Post	13	133.54	38.740				



**Figure 1.4: Bar graph represents Mean Pre and Post test scores of students having great, normal, and slight Metacognitive skill among Blended learning group(E G).**

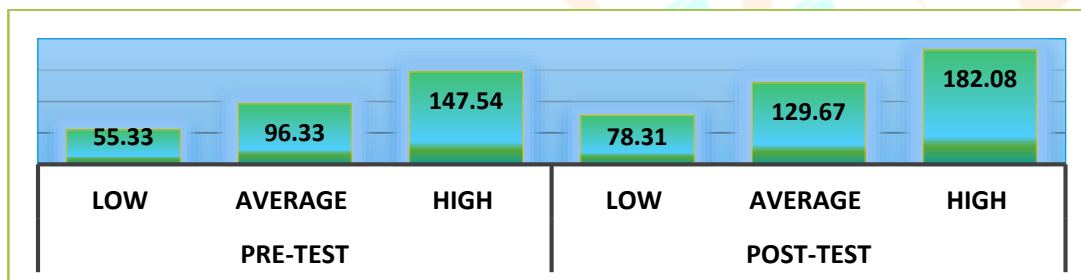
Table1 and figure 1.4 prove the distinctions amongst before test and After test scores of students categorized as high, average, and low from BLA-EG. The results indicate that the Average and Standard Deviation scores prior to and following the metacognitive intervention for the High group are Mean=156.25 and197.38, SD=7.990 and 12.238; for the Average group, Mean=140.08 and 183.00, SD=3.378 and 4.151; for the Low group, Mean=95.20 and 133.54, SD=34.763 and 38.740, respectively. A statistically significant difference was observed following the EG interventions. **Xingy geng et..al 2025,Elizabeth Acosta -Gonzaga et...al, 2021**,found a significant difference in their interventions of blended learning on high, average, low metacoganative skills..

**Inference:** Consequently, the previously stated research hypothesis is accepted. It can be retained. The t-values of 8.500 for high, 26.901 for average, and 2.836 for low, alongside  $p > 0.05$  values, indicate significance.

**H<sub>a</sub> 2:** There is a notable distinction amongst students with great, normal, and slight metacognition within the conventional group (CG).

**Table 2 shows differences in Mean Pre and Post test scores of students having great, normal, and slight Metacognitive skill among Conventional method (CG).**

Meta cognition collection	Exam	Control group						Hypotheses supported
		Sample size	Average	SD	df	t- worth	p- worth	
High /Great meta cognition	Pre	13	147.54	9.270	11	9.260	0.000	Yes
	Post	12	182.08	12.280				
Average/Normal meta cognition	Pre	12	96.33	31.416	11	2.009	0.070	Yes
	Post	15	129.67	24.365				
Low/slight meta cognition	Pre	15	55.33	4.894	12	5.819	0.000	Yes
	Post	13	78.31	11.658				



**Figure 1.5 Bar graph represents Mean Pre and Post test scores of students having great, normal, and slight Metacognitive skill among Conventional method (CG).**

Table 2 and figure 1.5 exemplify the distinctions amongst before-test and after-test scores of students categorized as high, average, and low from CM-CG. The results indicate that the Average and Standard Deviation scores prior to and following the metacognitive intervention for the High group are Mean=147.54 and 182.08, SD=9.270 and 12.280; for the Average group, Mean=96.33 and 129.67, SD=31.416 and 24.365; for the Low group, Mean=55.33 and 78.31 SD=4.894 and 11.658, respectively. A statistically significant difference was observed following the EG interventions. Xingy geng et..al 2025, Elizabeth Acosta -Gonzaga et...al, 2021, Shilan and Eric. C. K. Cheng 2021, Jody Langdon et... al 2019 and others found significant differences in their interventions of blended learning approach better than compared conventional methods on high, average, low meta cognitive skills

**Inference:** Consequently, the previously stated research hypothesis is accepted. It can be retained. The t-values of 9.260 for high, 2.009 for average, and 5.819 for low, alongside  $p > 0.05$  values, indicate significance.

## ii) Correlational analysis

2. To determine the significant relationship between academic accomplishment in geography and metacognitive skills taught via combined learning and conventional technique.

**H<sub>a</sub> 3:** There will be a notable positive association between outcomes accomplishment in geography and metacognitive skills in blended learning group (EG).

**Table 3 demonstrates connection between Academic achievement assessment in geography and Metacognitive skills among Blended learning group (E G ).**

Variables		Academic achievement test	Metacognitive skills
Academic achievement test	Pearson's correlation coefficient	1	.345*
	P-value		.029
	Sample size	40	40
Metacognitive skills	Pearson's correlation coefficient	.345*	1
	P-value	.029	
	Sample size	40	40

\*. Association is meaningful at the 0. 05 level (2-tailed).

Tabletop 3 is evident that here remains a considerable and favorable association among the academic achievement then metacognitive skills of EG students where n-40,r value is 0.345\* and the obtained p- value is 0.29 is lesser than the critical values at 0.05 level of significance. Pankaj bala 2023, Patel shireen 2021 found significant differences in their interventions of blended learning approach superior to compared conventional methods on correlation.

**Inference:** Therefore the above stated research hypothesis is accepted .it can be retained.

**H<sub>a</sub> 4:** There will be a notable positive association between outcomes accomplishment in geography and metacognitive skills in conventional method (CG).

**Table 4 displays the connection between Academic achievement assessment in geography and Metacognitive skills among conventional method (CG).**

Conventional method		Academic achievement test	Metacognitive skills
Academic achievement test	Pearson's correlation coefficient	1	.362*
	P-value		.022
	Sample size	40	40
Metacognitive skills	Pearson's correlation coefficient	.362*	1
	P-value	.022	
	Sample size	40	40

\*. Correlation is meaningful at the 0. 05 level (2-tailed).

Tabletop 5.11 demonstrates a substantial and favorable association among the academic achievement and metacognitive skills of CG students, where n-40, r value is .362\* and the acquired The p-value of 0.22 is less than

the grave values at the 0.05 level of consequence. Pankaj bala 2023, Patel shireen 2021 found significant differences in their interventions of conventional methods on correlation.

**Inference:** Consequently, the research hypothesis mentioned above is accepted and can be upheld.

## Conclusion:

The most effective kind of blended learning was developed in the digital realm. From elementary school to college, it's helpful to learn. Students can benefit from learning together in both synchronous and asynchronous ways using web-based teaching and learning tools with self-directed learning, its students can learn on their own. both in real time and at a different moment.

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