

# A Systematic Review on the Effectiveness of Metacognitive Strategies and Multimodal Tools in Blended Learning English Language Classroom

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**Abstract**—Blended learning was considered to be an effective approach to language learning in various fields as it significantly increases the learner's autonomy, engagement, curiosity, and effective comprehension. In the past years, various experimental studies have been carried out to examine the positive outcome of blended learning among English language learners. Since 2000, various research studies have been carried out to analyze the strengths and limitations of the blended learning classroom. The purpose of the present study is to systematically review the research papers published on blended learning from the year 2010 to 2021. The study investigates the effectiveness of blended learning specifically in English language classrooms. Blended learning is highly reliant on the English language tools and strategies employed while teaching. Hence, the study analyses the various metacognitive strategies and English language-based multimodal tools used in the blended learning classroom. The study reviews the method, approach, and strategies used in the blended learning classroom. 25 quantitative studies were selected for the systematic review. The study uses “Preferred Reporting Items for Systematic Reviews and Meta-Analyses” and Cochrane guidelines of systematic review to analyze the selected studies. Blended learning seems to be effective among English language learners and it has significantly developed students’ attention, academic achievement, student learning involvement, students engagement, active learning, student interaction, learning process, language proficiency, English language skills, learning motivation, improves concentration and provides a new learning experience. Nevertheless, variables like English language skills, various multimodal tools, and metacognitive strategies can significantly impact the effectiveness of the blended learning approach.

**Index Terms**—blended learning, metacognition, multimodal tools, mixed-mode learning, hybrid Learning

## I. INTRODUCTION

During the last two decades, a large number of models and frameworks have emerged in the blended learning approach. The blended learning approach has been efficient in various fields since 2000. Various multimodal tools and metacognitive reading strategies began to emerge in the past decade in the blended learning environment and the current study has selected articles from 2010 to 2021. The following reviews discuss the most influential models in metacognitive strategy and multimodal tools used in the blended learning language classroom. Blended learning was also used like “mixed-mode learning, hybrid instruction, and Technology-Mediated / Enhanced learning” (Wang et al., 2014). Blended learning employs offline teaching methods and technological tools for effective language learning instruction using a learning management system (Laborda, 2008). Metacognition is the strategy that has developed from the cognitive method. In the past decade, the metacognitive strategy was used widely in language learning and in applying the language function, based on the learner's English language needs. “The field of L2 teaching adopts the superordinate notion of teacher metacognition to better address the links between language teachers’ inner worlds, their classroom teaching, and students’ learning” (Whiteside et al., 2019). “To increase the Metacognition, adult learners can use Questioning, Revising and Assessing methods to ensure that they are on the right track” (Khodjakulova, 2021). Technology has gained massive importance in the 21st century due to its widespread influence among language learners. The teachers need to use technology in the teaching process to advance the concentration and attentiveness of the students. Technology was immensely used by the students and it is the right tool to draw the interest and attention of the students. This paper provides a detailed analysis of various studies carried out in the field of metacognition, and blended Learning and offers a wide range of information about metacognition, and multimodal tools used in blended learning classrooms.

### A. Literature Review

Husamah (2014) put forth that the term blended learning has two words, which is blended and learning. Blended refers to a combination or mix. Hence the term blended learning employs both offline teaching and technological interventions for effective language learning (Husamah, 2014). “Blended instruction offers an active learning environment with flexibility in using resources for the students and provides more time for faculty members to spend with learners in small groups or even individually” (Oh & Park, 2009). The reviews of Delialioglu (2011) and Eshreteh and Hisham Sijaj (2017) state the significance and educational relevance of blended learning. Jaleel and Premachandran (2016) in their research define metacognitive strategy as “thinking about one’s thinking”. The metacognitive strategy will help the students to be more attentive to what they are doing and also help them to be more sensible about how they can use the skills in different situations. Fooladvand et al. (2017) affirm that metacognitive strategies train the language learners with “self-regulation, understanding learning subjects, and the sense of knowing”.

### B. Research Question

RQ1 What is the research outcome from the literature and data collected on metacognitive strategies?

RQ2 What are the new trends employed using multimodal tools in a blended learning classroom in terms of the publication year (2010-2021)?

### C. Objectives

The study investigates the impact of Blended learning in English language learning from 2010 to 2021. It also examines the multimodal tools and metacognitive strategies employed in the blended learning classroom in the studies selected for systematic review.

### D. Rationale of the Study

The blended learning approach is dependent on the tools, methods, and strategies used in the teaching for effective learning. Blended learning employs various multimodal tools and metacognitive strategies for effective language teaching. Metacognitive strategies promote learner autonomy, and cognition and enable the learners’ to distinctively identify the language needed. The rationale of the current review study is to identify and analyze the existing research in the field of blended learning, that was published between 2010 and 2021 distinctively in English language teaching and learning. However, Blended learning is highly reliant on the multimodal tools and strategies employed in English language learning. Hence, the study analyses the role of various multimodal tools and various metacognitive language strategies in English language learning classrooms. Metacognitive strategies and multimodal tools play an important role in blended learning classrooms for effective comprehension of the English language by improving engagement and interest. A systematic review on blended learning was carried out in various fields like Health professions (Liu et al., 2016), clinical education (Rowe et al., 2012), Online learning (Rasheed, 2020), Cloud computing tools (Al-Samarraie & Saeed, 2018), Nurse education (McCutcheon et al., 2015), Medical education (Vallée et al., 2020), Programming courses (Alammary, 2019), Pre-service education (Atmacasoy & Aksu, 2018). In English language teaching, blended learning studies were conducted on cloud computing tools (Al-Samarraie & Saeed, 2018), academic writing (Akhtar et al., 2019), and writing skill (Quvanch & Na, 2020). The present study reviews the studies, which concentrate on the efficacy of mixed-mode learning in instructing English language skills, various language-based multimodal tools, and metacognitive strategies that were employed in the English language classrooms.

## II. METHOD

### A. Process of Manuscript Selection

The present study uses the systematic review method. “A systematic review method will analyze the studies of existing literature in a particular domain” (Uman, 2011). The study provides a comprehensive review of existing literature on the blended learning framework between 2010 to 2021. It categorizes, analyses, and assesses the methods, and findings of research in the blended learning approach that uses various multimodal tools and metacognitive strategies. The study reviews the research selected for the systematic review using PRISMA guidelines and Cochrane Guidelines. Selected studies were divided based on the inclusion and exclusion criteria following the PICOS (Population, Intervention, Comparison, Outcome, Design) framework. The study provides the findings of previous research, which will help the future investigation to analyze the existing research gap in the study.

### B. Categorisation and Definition

The paper characterizes the Blended teaching model in English language teaching by analyzing the different multimodal strategies utilized in English language education. Blended learning is an educational approach for effective teaching and learning that combines multimodal tools with traditional teaching methods. It is reliable on the multimodal tools and metacognitive strategies employed in the English teaching framework. Metacognition develops its principles from the cognitive approach to language learning. In the current study, the following categories were studied and analyzed,

1. Blended learning approach in English language teaching
2. Effective Role of blended learning in the English literature classroom

3. Multimodal tools employed in the English language classroom
4. Impact of metacognitive strategies in Blended learning classrooms.

### C. Reporting Standards

The study was carried out and reported according to the guidelines of Cochrane systematic review guidelines and PRISMA (Identification, Screening, Eligibility, Included).

### D. Eligibility Criteria

The Cochrane framework for systematic review was used for the inclusion of the studies. The PICOS framework was selected as an inclusion criterion. Studies were reviewed and selected for the review if they are carried out by English language students using a blended learning approach. The present review study also investigates the efficiency of the metacognitive strategy in blended learning classrooms for English language learners and various Multimodal tools employed in English language teaching. Detailed information on exclusion and inclusion criteria was discussed in the following table.

TABLE 1  
INCLUSION AND EXCLUSION CRITERIA

Criterion	Inclusion	Exclusion
Type of Course	Blended learning Multimodal tools in blended learning classroom Role of metacognitive strategy in blended learning classroom	Traditional learning, distance education Unimodal instruction, and traditional classroom tools like a blackboard, and flashcards. Employing other cognitive strategies in blended learning classroom
Publication Date	2010-2021 (11 years)	Before 2011
Publication Language	English	All other language studies
Publication type	Original Quantitative research.	Qualitative studies, Thematic reviews, and systematic reviews.
Study Context	School education and higher education in English language teaching	Interdisciplinary English studies
Student Performance	Continuous test, post-test, and pre-test	Surveys and Survey reports
Statistical Information	Quantitative reports with proper statistical information of mean and standard deviation.	Qualitative Reports

### E. Information Sources

The systematic research has been carried out in databases like ERIC, Taylor & Francis, Web of Science, EBSCO, and Scopus. The aforementioned databases were selected for the study as they provide eminent educational research articles related to the blended learning approach that employs, multimodal tools, and metacognitive strategies. Bibliographic databases like JSTOR, Research Gate, and Springer were used to refer to the educational research articles related to blended learning, multimodal tools, and metacognitive strategies.

### F. Search Strategy

Google Scholar was used as the search engine to find and categorize the articles. Advanced search and custom range search from 2010 to 2021 was used to effectively search and identify the articles related to blended learning that employ metacognition and multimodal tools. Word combinations like 'blended learning', 'multimodal tools used in teaching', 'hybrid learning', 'metacognition', 'metacognitive strategy and the English language', 'multimodal tools in blended learning', 'remote learning', 'flipped learning', 'cognition and metacognition', 'teaching through blended learning', 'metacognition in blended learning' were used as search terms in Google scholar and databases.

### G. Selection Process

In the primary screening, all the articles' abstracts and titles were screened. In the primary screening, articles related to blended learning in clinical studies, medical sciences, programming studies, cloud computing tools, and pre-service education were screened out. In English language teaching, articles related to traditional teaching approaches and metacognitive strategies in a non-blended learning environment were screened out. Finally, in the primary screening (n=73) seventy-three articles were screened out. In the secondary screening, the selection process was based on the PICOS (Population, Intervention, Comparison, Outcome, Design) which was carried out on the framework of PRISMA and Cochrane guidelines.

### H. Data Collection

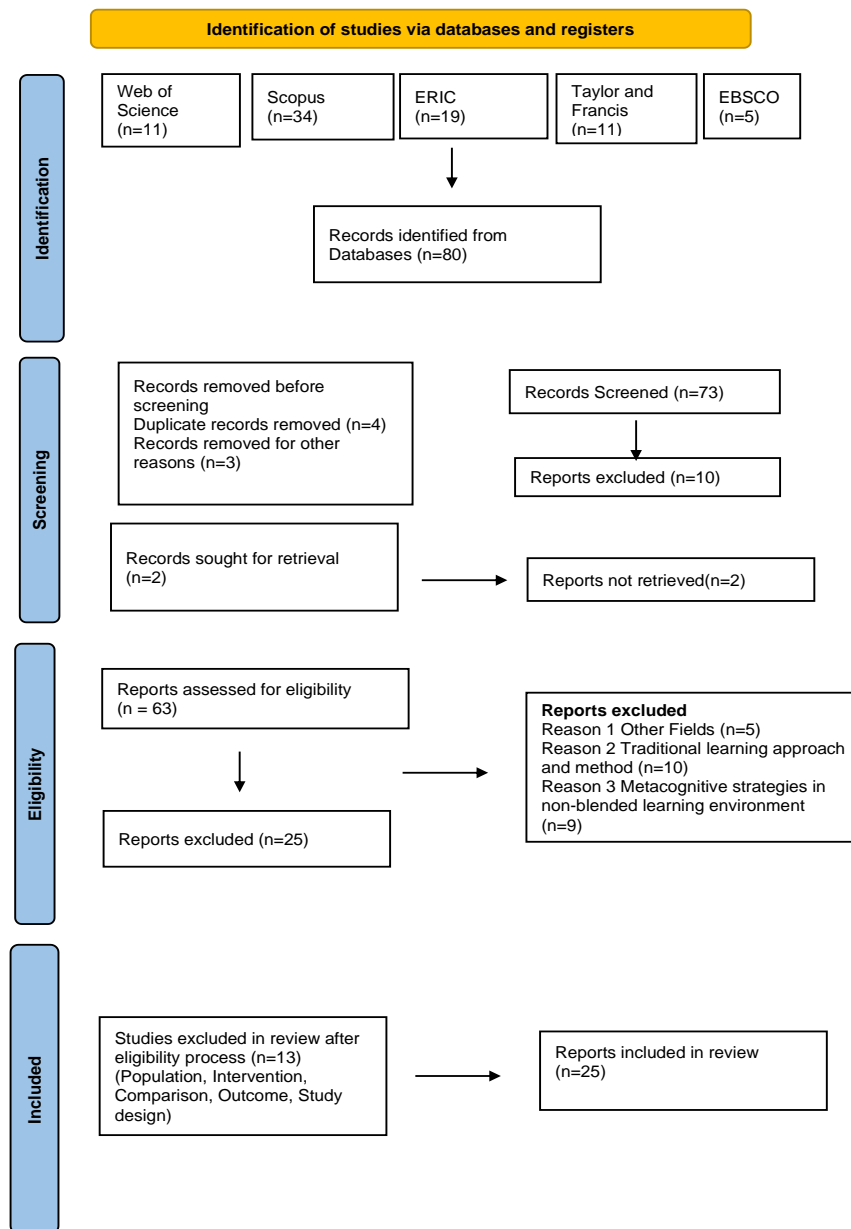


Figure 1 –PRISMA

*I. Data Synthesis Process*

The researcher has identified and extracted the relevant studies related to blended learning, that employ multimodal tools, and metacognitive strategies in English language classrooms. During the data collection process, aspects like PICOS (Participants, Intervention, Comparison, Outcome, and Design) were focused on selecting the studies for a standard data collection process and the data were tabulated in the table (Table 2). The statistical information of the studies was calculated and tabulated in the table (Table 5). The metacognitive strategies and multimodal tools were listed in Table 3 and Table 4.

III. RESULTS

*A. Distribution of the Selected Studies*

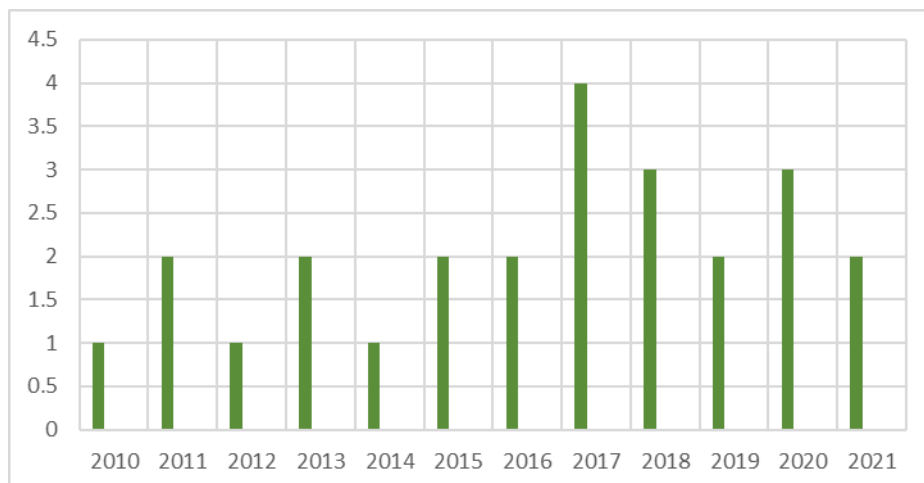


Figure 2. Distribution of the Selected Studies

The research in blended learning has flourished considerably. The chosen studies were analyzed based on the published year to find the maximum number of articles published in a particular year. 25 papers were chosen for the current review study. In the following chart, the total number of papers selected for the systematic review and their publication year have been categorized. The total number of papers was high in the year 2017 (n=4).

*B. Approach, Method Strategy Used in the Selected Papers*

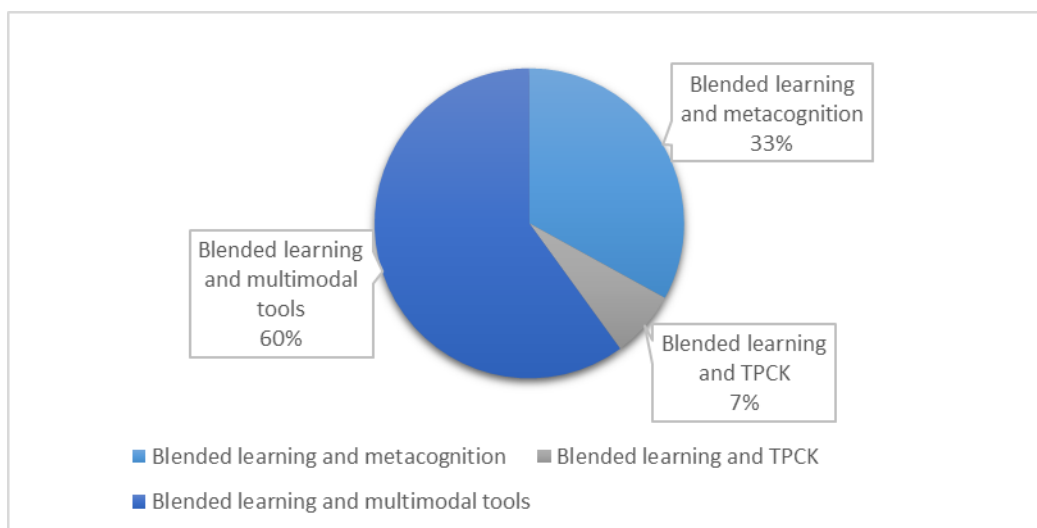


Figure 3. Approach, Method, and Strategy Used in the Selected Papers

The methods that are commonly used in the selected studies were blended learning, Metacognition, and TPCK. In Figure 3, the approach used in the selected studies for systematic review was categorized in the pie chart and the following inferences were drawn: Over 60% of the paper uses blended learning and multimodal tools, whereas 33% of the paper uses metacognition as the strategy to develop student’s cognition. 7% of the selected papers use TPCK (Technological Pedagogical Content Knowledge) approach to increase students’ language learning.

*C. Level of Samples Used in the Study*

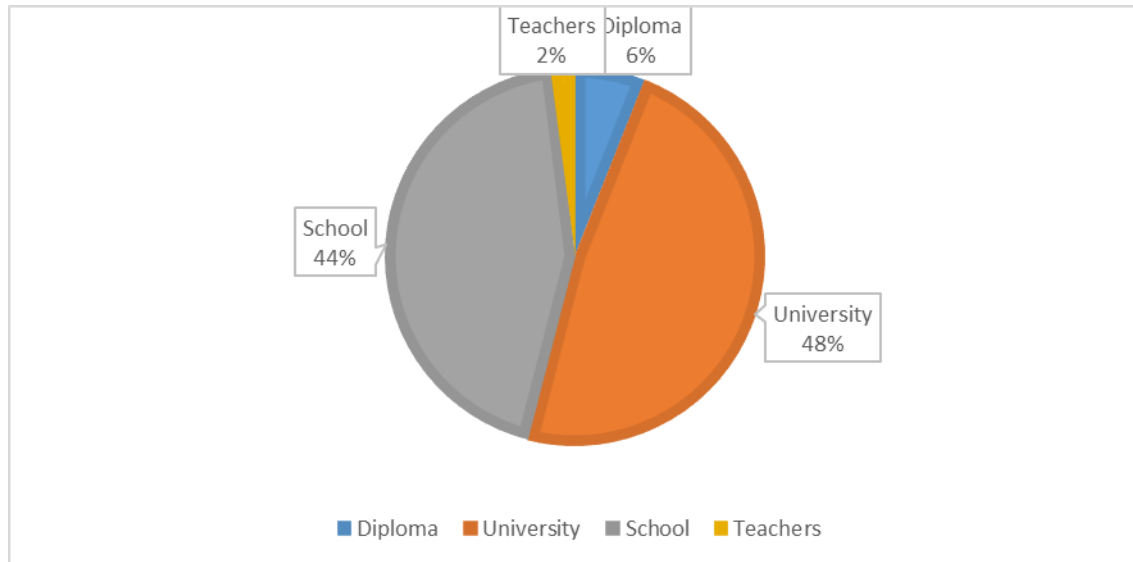


Figure 4: Level of Samples Used in the Study

In the chart (Figure 4), the samples of the studies selected for systematic review were categorized and the following inferences were drawn: Samples like school students of various grades, university students, and diploma students were used as the sample in the selected papers. School students were used as the sample in 44% of the selected articles, and 48% of articles use university students as the samples for the study, 6% of selected articles use diploma students, whereas 2% uses teachers as the sample for the study.

#### D. Significance of Blended Learning in ELT

Blended learning plays an important role in an English classroom as it grabs the attention and engagement of the learners. The following review discusses the significance of blended learning in the ELT classroom. Delialioglu (2011) in his article designed a computer network course and employed it as a “lecture-based blended learning environment” and as a “problem-based blended learning environment” to teach language in a blended learning classroom. Students' involvement, active learning, student interaction, academic challenge level, time on task, and course satisfaction were all dependent factors. Treatment 1 was a lecture-based blended learning environment, while Treatment 2 was a problem-based blended learning environment, and student individual factors were the independent variables. 93 junior pre-service computer teachers took part in the research. The survey method was employed in this study. During the study, students completed two surveys over two years. Subsequently, an engagement survey was conducted on the learners to analyze the student engagement with the problem-based intervention in a blended learning classroom. The findings prove that blended learning has significantly improved the language learning process among learners. Eshreteh and Hisham Siaj (2017) stress the importance of blended learning. In their research, they state the prominence of blended learning in the current language learning framework. One of the objectives of the study was to investigate learners' approach to the blended learning method at Hebron University. Variables of the aforementioned studies were discussed further. The approach used in the study was blended learning. The sample of the study was 40 students (8 male; 32 female) chosen from the English department of Hebron University. The students' attitude toward blended learning was examined by providing a questionnaire. The questionnaire's content validity was investigated by the specialist of the instructors of arts in education. The students were exposed to technology and they were taught through both technology and traditional methods. The outcome of the research showed that 70% of the students agreed that technology-based teaching was enjoyable and 85% of the students stated that it facilitates an effective learning process. The following table categorizes the studies selected for systematic review based on the PICOS criteria (PRISMA guidelines).

TABLE 2  
CHARACTERISTICS OF STUDIES INCLUDED IN THE SYSTEMATIC REVIEW

Study	Intervention	Population	Study Design	Concept/Theory/Approach	Outcome
Alam khan (2014)	It stresses the importance of e-learning among students. The blended learning was accomplished in his study through EMES (Electronic Management Education System)	King Abdul-Aziz University 34 students	Questionnaires were given before the instructional session and students were asked to prepare the answers from e-resources	Blended learning/ Multimodal Tools	The blended learning technique was found to be an effective approach for both the teachers and learners in the language learning framework.
Fakhir (2015)	It analyses the impact of employing blended learning on the flipped classroom and the effectiveness of blended learning among language learners.	Sixth-grade 50 students	Quasi-experimental method. An achievement test was conducted to assess student attitudes, a questionnaire was used.	Blended Learning/ Multimodal Tools	The quasi-experimental method was carried out. Students' attitudes were also measured using an achievement test and a questionnaire. Results show that blended learning has improved learners' attitudes and language proficiency.
Kim and Yoon (2014)	The purpose of this study was to offer a strategic learning design for L2 writing classes in a blended learning setting using smartphones.	A group of eight 29-year-old pupils from a private language institute	Questionnaires, pre- and post-tests, and interviews	Blended learning/ Multimodal Tools	Through exercises on Mokafe and Kakao chat, blended learning has improved students' writing skills in both quantity and quality.
Wahyuni (2018)	The purpose of this article is to investigate the impact of the blended learning paradigm on students' writing abilities.	Population-eleventh-grade students.	Telegram Messenger questionnaires, pre- and post-tests	Blended learning approach/ Multimodal Tools	The telegram teaching method was found effective in developing the writing skill of eleventh grade English language learners
Ginaya, Regeke (2017)	Through the use of the WebQuest project, the paper studies the impact of blended learning on speaking abilities.	51, 3 <sup>rd</sup> -year students of Diploma.	WebQuest-integrated instruction questionnaires, pre- and post-tests	Blended Learning/ Multimodal Tools	WebQuest-integrated instruction was found to be a successful method in improving the speaking skill of language learners.
Francis (2017)	The use of technology in the English language classroom has significantly improved the academic success of learners and instructors.	348 students and 65 staff of New England Charter School (NECS)	Survey results, student records, and direct classroom observations.	Blended Learning/ Multimodal Tools	A majority of learners (70%) felt that technology motivated them toward English language learning.
Bester and Brand (2013)	The study analyses the use of technology increases the learner's attention and motivates learners.	90 Students from First-year in high school	20-mark achievement test, Questionnaires	Blended Learning/ Multimodal Tools	The use of technology has enhanced academic achievement, attention, and concentration.
Xerri (2012)	Poetry teaching through the multimodal tools	English Literature Students	Questionnaire, Interviews Wikis, hypertext, blending visual and print media	Blended Learning/ Multimodal Tools	The result proves that it increases students' engagement and attention in the digital medium and gives new learning experiences to students, thereby uplifting poetry from books to a new platform for teaching
Ali Zahid Elley (2015)	The study emphasized the efficacy of blended learning in poetry teaching.	26 literature students	Pre-learning activity, Questionnaires YouTube videos	Blended Learning/ Multimodal Tools	The method was far more challenging, interesting, motivating, different, and unbound compared to old traditional practices
Kummin and Rahman (2010)	It assesses students' application of numerous cognitive and metacognitive methods, as well as 19 questions related to the management of resources in a blended learning classroom.	1 <sup>st</sup> -year students National University of Malaysia	MSLQ (Motivated Strategies for Learning Questionnaire)	Blended learning, Metacognitive Strategies, and Multimodal Tools	The result of the study proves that it increases the academic achievement of language learners. (Correlation coefficient is -.28, significance probability is .05)
Jaleel and Premachandran (2016)	It analyses the metacognitive strategy, thinking, reflection	180 secondary school students from the Kottayam district	Normative survey	Blended learning, Metacognitive Strategies, and Multimodal Tools	Metacognitive awareness of students was 113.48 and 13.69 and that of urban school students was 113.41 and 15.52. hence, the blended learning and

					metacognition approach has significantly improved the learners' language proficiency.
Al-Qahtani, A. A. (2020)	It inspects the efficiency of the "Think-Aloud strategy" in developing reading comprehension skills among Saudi EFL learners.	Saudi Arabia EFL learners (n=40)	Reading Comprehension Skills Test and Attitude Scale. Post-test. Pre-test.	Blended learning Metacognitive strategies and Multimodal Tools	The experimental group's attitudes and reading comprehension skills have considerably improved after the intervention.
Alamdari, E and Hosnbakhs han, L (2021)	The study analyses the "Comparative effect of L1/L2-mediated metacognitive intervention (MI) among learners	540 uppers intermediate EFL listeners ranging from 17 to 28 years of age	MALQ and an IELTS test	Blended learning Metacognitive strategies and Multimodal Tools	The metacognitive strategy has an effective impact on learners' listening skills.
Bangkom and Sukavatee, (2021)	It stresses the significance of oracy skills, and metacognitive awareness in ESL Thai students and develops students' oral skills through a blended learning environment.	29 learners Public School, Rayang	Single group experimental design Oracy Building Instruction via Blended learning Environment (OBIBLE)	Blended learning /Metacognition /Multimodal Tools	It proves that blended learning and metacognitive strategy proved to be an effective method in improving oracy skills.
Astuti et al., (2021)	It improves the writing skill of the participants through a blended learning approach and metacognitive strategy	243 Learners State University of Semarang	It is population research and employs Pre-Experimental Intact-Group Comparison.	Blended learning /Metacognition /Multimodal Tools	Blended learning and metacognitive strategy has significantly developed the writing skill of the learners
Ting and Chao, (2013).	It analyses the effectiveness of the blended learning method in improving the self-regulated learning strategies among EFL learners.	22 participants Vocational college learners in Applied English	The research was applied in a semester on a writing course. TOEIC tests were conducted on the learners.	Blended learning /Metacognition /Multimodal Tools	Moodle and self-regulated strategies helped the learners to develop their writing skills and language acquisition.
Yang (2012).	The study employs blended learning and metacognitive strategies to improve the learners' reading difficulties	108 learners	Semi-structured Questionnaires and interviews, log files were the instructional materials	Blended learning /Metacognition /Multimodal Tools	Through online reading resources and metacognitive strategy, the learners reading proficiency have improved. Peer learning has developed self-regulated learning among the participants.

### E. Impact of Blended Learning in Literature Classroom

In English literature classes, the blended learning technique was used to improve comprehension and language learning. The reviews of Abdussalam AbdAlla (2017), Dwaik et al. (2016), and Madhavi and Lakshmi (2016) affirm the effectiveness of the blended learning approach in content comprehension and language acquisition. Abdussalam AbdAlla (2017) investigated the status of technology integration in teaching literature at the University of Khartoum's Department of English by examining three factors: "teachers' and students' attitudes and use of technology, teaching literature approaches, and the impact of technology integration on the teaching process". It employs a mixed methodology that includes "two sets of questionnaires, classroom observation, structured interviews, and case studies" (Abdussalam AbdAlla, 2017). Data was gathered from 14 teachers and 143 students. He introduced the TPCK (Technological Pedagogical Content Knowledge) approach in analyzing the role of technology. Knowledge is divided into three interdependent components in the TPCK framework:

- **Content knowledge** is the information of the content material which has to be comprehended or instructed.
- **Pedagogical knowledge** is the information an instructor should have about methods or approaches employed in the language learning classroom, the characteristics of the learners, and the approaches used in assessing learners' comprehension of the content.
- **Technological knowledge** refers to a person's ability to utilize information technology productively daily.

The result of the study affirms that using technology in teaching literature and applying project-based learning proved that this method would establish the student-centered strategies in developing their autonomy and motivation, as well as engaging them in the learning process.

Dwaik et al. (2016) focus on the English learners' interest and attitude towards blended learning in language learning classrooms. "The Modular Object-Oriented Dynamic Learning Environment" (MOODLE) platform had been used as a multimodal tool in a blended learning classroom. Samples of the study include English language learners, who were enrolled in the "American Literature" course at Hebron University. 26 students were selected for the research, and the sample students were given a questionnaire related to their usage of the internet and the duration of internet surfing. Based on this data, students were asked to learn via the internet and MOODLE and the outcome was drawn. The result



of the research proved that the learners develop confidence while learning different approaches in learning English literature courses using ICT. The students who accessed the online course, MOODLE showed greater involvement and effective learning.

In the research carried out by Madhavi and Lakshmi (2016), technological aids were used to teach poetry effectively through blended learning. Students of Kakinada school were selected as the samples for the study. The following topic discusses the approaches employed in the flipped classroom. A pre-prepared Prezi, a follow-up questionnaire, a checklist, and an informal interview with students and teachers were the key instruments employed in this study. The poems were taught to the students through Prezi by visualizing their content and its true essence. The impact of Prezi in poetry teaching was administered by giving questionnaires. Multimodal methods are effective at engaging the attention, cognition, focus, and learning abilities of English language learners. The result of the study showed that Prezi provided a novel learning experience for 81 percent of the pupils. Prezi was deemed to be more appealing by 58 percent of pupils than the usual technique of teaching. From the aforementioned reviews, blended learning was found to be an effective approach in the literature classroom as it imparts content knowledge and pedagogical knowledge by developing learners' interest in learning literature. The following table discusses the various multimodal tools employed in blended learning language classrooms.

TABLE 3  
MULTIMODAL TOOLS EMPLOYED IN THE STUDY

Delialioglu (2011)	Computer Network Course (for English language Teaching)
Xerri (2012)	Wikis, hypertext, blending visual and print media
Bester and Brand (2013)	Web browsers, PowerPoint presentation, Skype, E-mail.
Kim, Yoon (2014)	Mokafe and Kakao talk
Alam khan (2014)	EMES (Electronic Management Education System)
Fakhir (2015)	PowerPoint slides, computer E-resources, data show, and resources
Ali Zahid Elley (2015)	Youtube Videos
Dwaik et al., (2016)	Modular Object-Oriented Dynamic Learning Environment (MOODLE)
Madhavi and Lakshmi (2016)	Prezi, YouTube Videos
Eshreteh and Hisham Sijaj (2017)	LMS (Learning Management System), E-Resources
Ginaya and Regeke (2017)	WebQuest-integrated instruction
Francis (2017)	Learning Management System (LMS)
Abdussalam Abdalla (2017)	Web browsers, PowerPoint presentations, E-resources
Wahyuni (2018)	Telegram Messengers
Bangkom and Sukavatee, (2021)	Oracy Building Instruction via Blended learning Environment (OBIBLE)
Astuti et al., (2021)	E-Learning Management System
Ting and Chao, (2013).	Moodle, Course Management System (CMS)
Yang (2012).	Log files, Online reading resources

#### F. Influence of Metacognitive Strategy on Student's Motivation

"The field of L2 teaching adopts the superordinate notion of *teacher metacognition* to better address the links between language teachers' inner worlds, their classroom teaching, and students' learning" (Hiver et al., 2021). Learners have to reflect upon their learning strategies whereas teachers should reflect on their level of teaching and metacognitive strategic knowledge and executive management strategies (Al-Jarrah & Tamer Mohammad, 2019). Fooladvand et al. (2017) specify that both cognitive and metacognitive approaches are extremely advantageous in helping students learn and achieve. It motivates the learners to learn and comprehend the language content effectively. They also affirm that the Metacognitive strategies are most effective in the students of experimental sciences. Both cognitive and metacognitive strategies have high positive effects on students' academic achievement. Table 4 lists the metacognitive strategies employed in the blended learning classrooms. Table 2 enumerates the characteristics of the studies included in the systematic review.

TABLE 4  
METACOGNITIVE STRATEGIES EMPLOYED IN THE STUDIES INCLUDED IN THE REVIEW

Study	Metacognitive Strategies
Kummin and Rahman (2010)	"Rehearsal, Elaboration, Organisation, Critical thinking, and Meta self-regulation".
Jaleel and Premachandran (2016)	Thinking, Reflection, and Metacognitive Awareness.
Fooladvand et al., (2017)	Metacognitive Regulation
Al-Jarrah and Tamer Mohammad (2019)	Metacognitive strategic knowledge and Executive management strategies
Bangkom and Sukavatee, (2021)	Metacognitive awareness, metacognitive experience, metacognitive knowledge
Astuti et al., (2021)	"Anticipation or planning, paying attention, self-management, self-monitoring, problem identification, and self-evaluation".
Ting and Chao, (2013).	"Motivation strategy, cognitive strategy, meta-cognitive strategy, and action control strategy".
Yang (2012).	Metacognitive strategic awareness, knowledge, and experience

## IV. DATA ANALYSIS

The researcher has identified the number of participants, mean value of the control and experimental group, and standard deviation of control and the experimental group from the selected papers. The data were tabulated in excel and the mean difference is calculated for each study to analyze the effectiveness of the blended learning approach which uses metacognitive strategy and multimodal tools. Mean Difference (MD) is the standard statistic measure that analyses the mean value of the control and experimental group to identify the effectiveness of the approach or method or tools employed in the study. The Formula of Mean Difference is  $(\sum x1 / n) - (\sum x2 / n)$  Where  $x1$  refers to the mean of group one,  $x2$  refers to the mean of group two and  $n$  denotes Sample size. Hence in table 5, the mean of the control group and experiment group and the total number of participants were tabulated to analyze the mean difference.

TABLE 5  
DATA ANALYSIS

Study	Participant s(N)	Mean (CG)	Standard deviation (CG)	Mean (EG)	Standard deviation (EG)	Mean Difference (MD)
Bester and Brand (2013)	45	6.41	2.28	8.87	1.25	2.46
Kim and Yoon (2014)	16	60.03	12.586	87.10	4.151	27.07
Alam Khan (2014)	34	3.47	2.035	4.29	2.201	0.82
Fakhir (2015)	50	3.24	1.923	4.33	2.287	1.09
Ginaya and Regeke (2017)	51	63.05	6.692	84.43	4.649	21.38
Wahyuni (2018)	68	76.13	8.181	82.19	5.086	6.06
Kummin and Rahman (2010)	50	3.298	2.890	3.669	1.780	0.371
Jaleel and Premachandran (2016)	180	110	14.67	114	30.72	4
Al-Qahtani, A. A. (2020)	40	30.01	7.41	31.04	7.11	0.03
Alamdari, E and Hosnbakhshan, L (2021)	180	12.57	2.43	16.15	1.55	3.58

In Figure 5, the Mean Difference (MD) of the studies was plotted, where the x-axis denotes the studies and the y-axis denotes the Mean Difference between the control group and experimental group. According to Mean Difference (MD), the value below 0 denotes the no improvement or difference in the study whereas the value above 0 denotes the improvement or effectiveness of the method. All the values mentioned in the reviews were above 0 and it denotes the effectiveness of the blended learning classroom in the English language classroom.

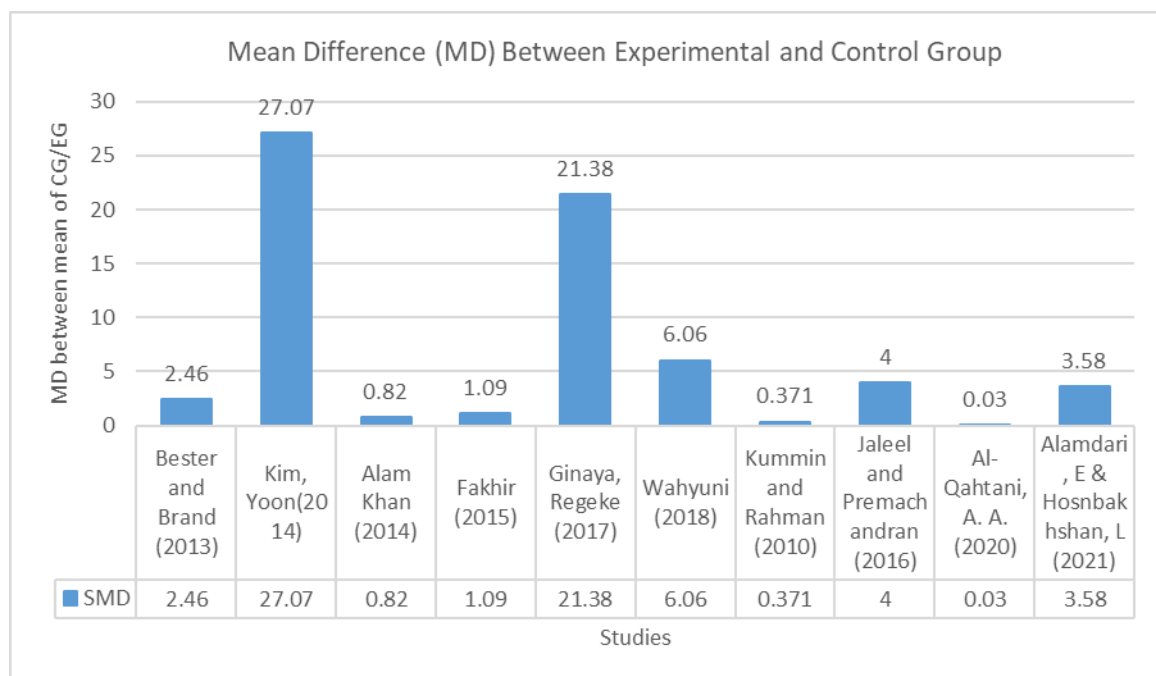


Figure 5: Plot of the Effectiveness of Blended Learning Classroom

## V. DISCUSSION

### A. Principal Findings

Analyzing the effectiveness of blended learning was complex and it is dependent on the various multimodal tools employed in the blended learning classrooms. Studies selected in the systematic review affirm that the blended learning has significantly developed students' attention (Xerri, 2012), academic achievement (Kummin & Rahman, 2010), students learning involvement (Dwaik et al., 2016), providing new learning experience (Xerri, 2012), students engagement (Delialioglu, 2011), active learning (Delialioglu, 2011), student interaction (Delialioglu, 2011), effective

learning process (Kummin & Rahman, 2010), language proficiency, English language skills, learning motivation (Madhavi & Lakshmi, 2016) and improves concentration. Among the above-mentioned studies, the work of (Alam Khan, 2014) proves that the study through EMES (electronic management education system) was effective. Online courses were found effective in acquiring the content by the students. Ali Zahid Elley (2015) in his study proved that blended learning is a positive approach in the current education system. Dwaik et al. (2017) claim that blended learning increases the students' participation through which students learn the content effectively. Madhavi (2016) used Prezi as a tool for language teaching. This study showed a positive outcome from the students of Kakinada and the approach was effective in teaching language to the students. Kummin and Rahman (2010) affirm that employing a Metacognitive strategy makes the learners proficient in language learning. Pre-test and post-test were used to draw the results of the study. The studies reviewed above prove that blended learning which employs metacognitive strategy, and multimodal tools can be considered to promote effective learning in the English language classroom.

The various studies mentioned above have offered a wide range of information about metacognition, blended learning, and multimodal tools. Blended Learning instills motivation and consistency in language learners. It develops students' attention, concentration, participation ability, and engagement. The blended learning approach was observed to be a highly effective method in teaching the English language. The multimodal tools employed are Learning Management system (LMS), Motivated strategies for learning questionnaire (MSLQ), wikis, hypertext, blending visual and print media, "Modular Object-Oriented Dynamic Learning Environment" (MOODLE), Electronic Management Education System (EMES) were the multimodal tools used in the blended learning classrooms. Multimodal tools aid in better concentration, attention, and cognition among English language learners. Metacognition has increased the cognitive functions, memory abilities, and attention capabilities among English language learners in a blended learning classroom. The metacognitive strategy will enable the learners to think and reflect on their language needs. The metacognitive strategies are rehearsal, elaboration, organization, critical thinking, meta self-regulation, thinking, reflection, metacognitive awareness, metacognitive regulation, metacognitive strategic knowledge, and executive management strategies.

#### B. Limitation

1. Blended learning has flourished since the year 2000, but the study focuses on the studies that were carried out on blended learning from 2011 to 2021 to reduce the heterogeneity of the studies.
2. It focuses on the multimodal tools employed in the blended learning approach. The studies that use multimodal tools in CBI, CLIL, Natural approach, and other approaches were excluded.
3. It examines and lists the metacognitive strategies employed in the blended learning framework, other studies, which employ cognitive and metacognitive strategies in the traditional approach were excluded.

#### C. Recommendations for Future Research

1. Further investigation has to be done on the experimental method and approaches used in the blended learning classroom.
2. Research has to be done in the various multimodal tools used in the language learning classroom during the pandemic period, to facilitate further research.
3. In future research, the language skills and language areas like Listening Speaking Reading Writing skills, vocabulary skills, grammar skills, and language functions should be focused on further investigation.

## VI. CONCLUSION

The study emphasizes that blended learning has a positive approach among English language learners. Implications can be drawn from the study for future research and investigation in blended learning classrooms and English language learning could be carried out. The study lists the various multimodal tools and metacognitive strategies that are effective in a blended learning classroom, which can be inferred for future research in blended learning. However effective blended learning environment is highly dependent on the multimodal tools and methods employed. Therefore, educational research should focus on the methods and tools employed in blended learning classrooms. All the mentioned studies prove that blended learning, Metacognitive strategy, and multimodal tools improve the learner's attention by drawing their interest thereby rendering effective comprehension. From the data analysis, it is inferred that blended learning was more effective in drawing the learners' interest and practically operative than the traditional methods and strategies.

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