

Literature review on the benefits and challenges of active learning on students' achievement

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Abstract

Rapid changes in the education system in the 21st century require active learning among students to maintain the system's relevance to the most recent trends and developments. Generally, the fact that active learning is not a new learning style has attracted scholars to conduct numerous relevant studies. Unfortunately, most past researches were not from the perspectives of the benefits and challenges. Hence, the present study reviewed a considerable number of past studies on active learning benefits and challenges. The objective of this study is to identify the benefits and challenges of active learning on student achievement. The Systematic Literature Review (SLR), which comprises a review protocol that includes the subject to be examined and the best approach for carrying out this research, was applied as a research methodology. The SLR technique comprises three phases: searching, screening, and analyzing. According to this investigation, there are six cognitive-related benefits, and the dominant benefit is increased academic performance. Hence, there are six challenges in student factors, however, time restriction is the highest challenge faced by students. Finally, several recommendations were presented at the end of this research for the reference of future scholars.

Keywords- Active learning; benefits; challenges; time restrictions; academic performance

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1. Introduction

In recent decades, the pedagogical paradigm has undergone a significant transition, favoring active learning (Misseyni et al., 2018). Active learning has emerged as a key strategy for enhancing students' comprehension and involvement at all educational levels. It is described as the active engagement of students in their learning process via classroom activities or discourse compared to simply passive listening (Bonwell & Eison, 1991). Learning takes place through various activities such as group collaboration, cooperative learning, gamification, peer learning, project-based learning, problem-based learning, as well as many more (Mohamad Ali et al., 2018). Student-centered learning will encourage students to be actively involved and assist them in better understanding the learning activities given in the classroom better.

Active learning techniques are an effort and opportunity for students to actively build their knowledge (Patil & Kamerikar, 2020). This is because active learning techniques involve students in the hands-on and mind-on processes. Effective active learning creates innovative and creative student imaginations both in and outside the classroom (Kerns, 2019). Active learning also provides an opportunity for students to develop high-level thinking ability, i.e., analyze and synthesize, as well as to evaluate various learning activities, thus applying them in their daily lives (Florenge Anak & Khairul Azhar, 2021). Based on the philosophy of education, meaningful learning is active learning built on the constructivist paradigm, in which students mostly develop their cognitive structure via their own experiences from their prior knowledge.

In today's increasingly challenging educational era, active learning is seen as an impetus and a necessity that can improve student achievement (Cattaneo, 2017). Although active learning has been practiced for decades in the education system and has produced positive effects, many teachers and students are still practicing traditional student-centered learning. Besides, learning activities other than active learning, such as teacher-centered lectures, are still dominant. In contrast, active learning is still an alternative technique that only results in one-way learning from the teachers. There are also many challenges faced by both teachers and students in implementing effective active learning (Pratiwi et al., 2021). Nonetheless, active learning provides a variety of different learning experiences to students and the education system as a whole (Rosier, 2017).

In order to fulfill the educational system's aspiration to produce quality students, one of the key elements to be noted is the learning technique, which is a student-centered active learning technique. The change in the educational system depends on the achievements of the school and students as the basis for the success of the educational system. The basic idea behind active learning is to enhance both teachers' and students' classroom experiences. When students participate actively in class, they do a variety of activities like writing, discussion, reading, and problem-solving, as well as high-level thinking (analysis, synthesis, and evaluation). These activities can also improve their critical thinking skills (Alehegn Sewagegn & M. Diale, 2019) and indirectly improve student performance and achievement. Students are essential to the success and efficiency of the educational system. To maintain the education system's relevance to recent advances, consideration should be paid to student learning strategies.

Active learning should be practiced by students for several reasons. According to (Stevani & Feadani, 2019), active learning can maximize a student's potential so that all students can achieve satisfactory learning results. Secondly, the continuous development of students in the classroom can be traced through the implementation of active learning and systematic classroom assessment (Moktar et al., 2018) & (Ali et al., 2018). Subsequently, active learning is very effective in improving students' understanding of a subject and, in turn, improving students' performance in the subject (Wiliawanto et al., 2019). Creative and active people are needed to handle today's rapid development. Future students will also have to overcome significant challenges, given how rapidly the world community is changing. To solve this problem, the education system requires active learning that actively engages students in building their knowledge. Thus, learning turns more permanent and

meaningful throughout life (Suherman et al., 2021). In short, student-centered active learning is essential for the development of educational systems at all levels of learning, which can help create a more independent and responsible society. Therefore, the educational profession should consider active learning to be essential.

It is primarily essential to be aware of the benefits and challenges of active learning, either directly or indirectly, on teachers and students in order to improve the students' active learning. Thus, this research will determine and assess the benefits and challenges of active learning on student achievement based on past studies. Ultimately, it is hoped that this research will facilitate future studies' preparation for active learning, especially among students. The purpose of this systematic review was to find answers to the following questions:

1. What are the population's target levels of active learning?
2. What is the dominant benefit of active learning?
3. What are the most challenging factors in active learning?

2. Methods

The systematic and explicit process of identifying, selecting, critically evaluating, collecting, and analysing data from prior studies about the topic being studied is known as the Systematic Literature Review (SLR). It was applied in this research by (Moher et al., 2009). This method was chosen since it facilitates the synthesis of all academic literature related to learning methods and student achievements in detail. This systematic literature review depends on the approach suggested by (Petticrew & Roberts, 2008), who emphasized sensitivity and a more specific search. Such sensitivity refers to the search for a large number of relevant studies. Therefore, this study has undergone seven processes, which include defining a research question or hypothesis, determining the research type, conducting a comprehensive literature search, filtering the search results, evaluating the included studies, synthesizing studies, and evaluating heterogeneity among studies.

In addition, all publications pertinent to active learning are also reviewed systematically in this research to accomplish the primary objective of the investigation, in determining the dominant benefits and challenges of active learning on student achievement. The findings of this systematic literature review will give a broad overview of the benefits and challenges in creating the basic conceptual framework of the research on students' active learning.

2.1 Searching Strategy

SCOPUS and WOS are the two primary academic database types that are employed in the process of discovering pertinent articles. The method of article selection is depicted in Figure 1, which is taken from (Karabulut-Ilgu et al., 2018). The English keywords have been searched. Additionally, the search process was further conducted using the keywords "active learning benefits and student achievement" and "active learning challenges on student achievement" in Malay, as well as "impact of active learning on student achievement" and "active learning on student achievement" in English. In order to find the most recent publications, the search procedure utilizing these keywords was also conducted by restricting the year of publication from January 2018 to July 2022.

Figure 1 shows multiple screening phases of the original publications that were completed to acquire the proper and pertinent articles. Based on several acceptance and rejection criteria, the initial screening was conducted. The acceptance criteria include 1) complete utilization of keywords, 2) full access articles, 3) research in the education context, as well as 4) articles in English or Malay. In contrast, three rejection criteria consist of 1) articles that are not entirely accessible, 2) articles that are outside the educational context, as well as 3) articles in languages other than Malay and English.

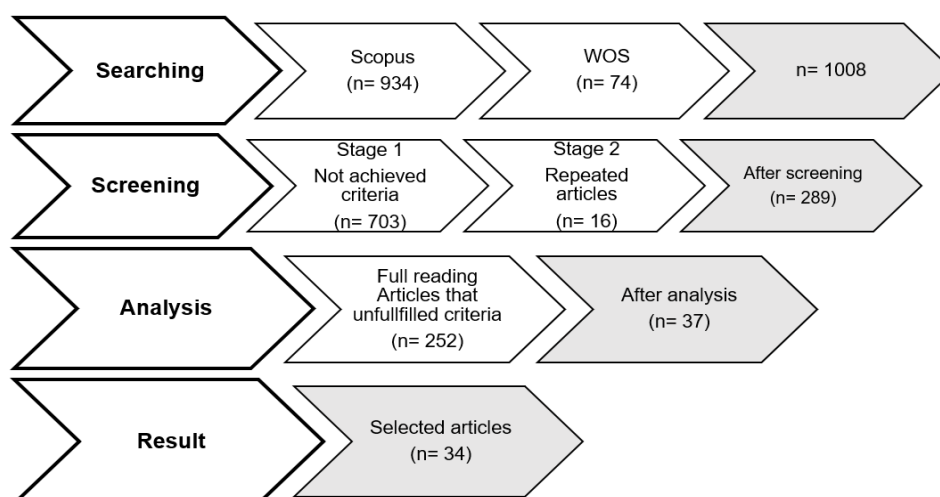


Figure 1. Article selection process adapted from (Karabulut-Ilgu et al., 2018).

2.2 Selection Criteria

The second screening was done to filter recurring past articles by reading each title and abstract. In contrast, the final screening is based on a thorough reading of the remaining publications to filter publications that are irrelevant to the study requirements. A total of 34 articles were chosen after the search, screening, and filtering processes (Table 1).

Table 1. Overview of the included studies

Authors & Year	Country	Studies
Adams, C., & Dove, A. (2018)	USA	Investigate one potential teaching strategy, known as flipped learning, in contrast to conventional lecture-based instruction, to determine if it could help students learn Calculus more effectively.
Aji, C. A., & Khan, M. J. (2019)	USA	Explained how active learning in introductory math and aerospace engineering classes affected the academic achievement of students from underrepresented groups in STEM.
Al-Amri, M. (2018)	Saudi Arabia	Exhibited severe academic procrastination that has negative consequences on academic achievement with reasonable regularity across a high percentage of undergraduate college students.
Alogiliy, M. et al. (2021)	Jordan	Analyzed the impact of employing educational games for active learning on seventh-grade students in Wadi Al-Sir Directorate, Jordan, academic achievement and persistence in the English language course.
Andres, H. (2020)	USA	Examined a theoretical framework that explores and deepens our understanding of how cognitive/information processing, learning motivation, and learning task behaviors support student engagement, academic performance, as well as course persistence.
Bailey, R. L. et al. (2020)	USA	Contrasted pre- and post-intervention material retention and views of a team-based, active learning course redesign intervention in an undergraduate nutrition class.
Berssanette, J. H., & de Francisco, A. C. (2021)	Brazil	Describe the strategies, pedagogical methods employed, applications, contributions, and implementation challenges.
Borrego, M. et al. (2018)	USA	In undergraduate STEM classes, the affective reactions of the students were investigated.
Bosio, G., & Origo, F. (2020)	Italy	Investigated the effect of teaching methods on students' academic performance in tertiary entrepreneurship education (traditional vs. active mode).
Cardozo, L. T. et al. (2020)	Brazil	Assessed the effect of a lecture and an active methodology on the stress and anxiety levels and learning of undergraduate students.

Carstensen, S. S. et al. (2020)	Denmark	Reported the results of employing 27 peer instructions to promote collaborative, active learning in pharmacology courses.
Cho, H. J. et al. (2021)	USA	Examination of the flipped classroom performance of undergraduate mechanical engineering students.
Crisafio, A., & Cho, S. H. (2020)	USA	Evidence that the increase in active learning did not improve students' performance in the NBME Subject Exam in psychiatry.
Guimaraes, L. M., & Lima, R. D. S. (2021)	Brazil	The use of active learning in an engineering education institution in Brazil employing repeated experimental design measures was presented, along with its methodology and outcomes.
Handayani, P. W. et al. (2021)	Indonesia	There is proof that e-learning via a learning management system (LMS) is anticipated to be a solution to the demands of remote learning, particularly in a pandemic situation.
Hoyt, S. et al. (2020)	USA	Information was given on how to gauge the success of active learning in engineering classrooms by looking at student achievement.
Ismail, R. et al. (2020)	Malaysia	Studied how active learning in the economics class affected students' academic achievement, motivation, interest, and social interaction.
Kopecki-Fjetland, M. A. (2019)	USA	Described an iterative process for introducing interventions to improve students' foundational concept knowledge.
Lamon, S. et al. (2020)	Australia	Analyzed the active learning opportunities provided by an online learning environment that guides and self-directs the delivery of information to postgraduate students.
Lugosi, E., & Uribe, G. (2022)	USA	Outlined the active learning techniques employed in college algebra and business calculus classes for undergraduates.
Macleod, J. et al. (2019)	USA	Presented a synthesis of comparative research, which examines the technology that enables active learning classrooms in higher education.
Marcela Hernandez et al. (2019)	USA	Provided concepts and practices that top universities are doing to support active learning.
Nguyen, K. A. et al. (2021)	USA	Aided the implementation of active learning and addressed students' affective and behavioral responses.
Patil, S. S., & Dharwadkar, N. V. (2020)	India	The necessity for a paradigm changes in which the teaching-learning approach must place a strong emphasis on student engagement to promote tangible learning was demonstrated.
Riedl et al. (2021)	USA	Developed and implemented a flipped active learning paradigm in the general biology course for first-semester majors at a sizable community college in a suburban area to study the effects of active learning.
Rincon-Flores, E. G., & Santos-Guevara, B. N. (2021)	Mexico	Observed that gamification employing a reward-based system denotes a strategy that is capable of enhancing the educational experience under exceptional circumstances.
Shi, Y. et al. (2020)	USA	Studied the benefits of active learning by developing and implementing a flipped active-learning paradigm in the general biology course for first-semester majors at a large community college in a suburban setting.
Shroff, R. H. et al. (2021)	Hong Kong	Outlined the creation and validation of the Active Learning Strategies Inventory (ALSI), a psychometrically sound tool that assesses learners' views of their active learning strategies in the context of active learning.
Sinnayah, P. et al. (2019)	Australia	With the addition of guided-inquiry learning and other active learning methodologies, two first-year Bioscience for Paramedics modules were redesigned, evaluated, and their effects on student performance were calculated.
Situmorang, M. et al. (2020)	Indonesia	A creative learning resource with projects was made available to encourage active learning and raise students' performance in chemistry.
Sumanasekera, W. et al. (2020)	USA	A variety of active learning strategies were used in pharmacology, and the best strategy for fostering knowledge was examined.
Tobin, R. G. (2018)	USA	Presented on a small-scale project to try to implement active-engagement strategies in recitation parts of an introductory physics class when similar pedagogical techniques were previously employed in lectures.

Zawawi, W. W. M. et al. (2019)	Malaysia	When implemented by lecturers who are not educated in active learning, the efficiency of employing the BLOSSOMS Thermodynamics Energy Conversion video towards student learning in a classroom was evaluated.
Zimanyi, M. A. et al. (2019)	Australia	Evidenced changes to delivery with students' active learning in mind.

3. Results

The primary goal of this research is to determine the benefits and challenges of students' active learning achievement through a systematic literature review. Generally, 34 benefits of active learning were proven to have a substantial influence on the achievement of the student, directly or indirectly. As proposed by (Leksuwanakun et al., 2022) in their investigation, the effects of active learning are split into active learning challenges, student efficacy and 21st-century skills, as well as cognitive domains among students, which can be then classified as per similarities and characteristics. The research employed the categories proposed by (Leksuwanakun et al., 2022) because their research possesses more relevant to the student context and active learning, which includes a wide range of benefits and challenges. Evidently, "improved academic performance" is the most frequently examined benefit with 25 studies in total, followed by "improved achievement" with 17 studies in total. However, the benefit of "self-confidence" was the lowest in only 1 study.

3.1. Population Target

Table 2 shows a total of 34 studies according to the population target identified in this study. In reference to active learning, the population target includes students and teachers. Based on the analysis, there are three population target levels, namely primary school (1 study), secondary school (5 studies), and higher education (28 studies), which recorded the highest frequency and outperformed the rest of the populations. Based on all 34 studies on active learning, most of the studies constitute the student category (33 studies), while only 1 study constitutes the teacher category. All of these population targets are the results of studies based on cultural diversity from around the world. Active learning is more often applied to students of higher education than in primary and secondary schools. This signifies that both the teachers and the students are utilizing active learning in education. This review also informs us that active learning is growing increasingly popular, with students being the primary beneficiaries.

This article's findings will also be extremely beneficial to teachers and students. It can provide a clear image of the most beneficial and challenging of active learning. From the analysis of the studies, it is possible to infer the growing interest among researchers in exploring the relationship of active learning between students and teachers. The number of studies on active learning presented and experimentally assessed has increased significantly in recent years, contributing to this result.

Table 2. Previous research on active learning concerning population target (2018-2022)

Authors / Population Target	Elementary	Secondary School	Higher Education	Students	Teacher
Adams, C., & Dove, A. (2018)		*		*	
Aji, C. A., & Khan, M. J. (2019)			*	*	
Al-Amri, M. (2018)			*	*	
Alogiliy, M. et al. (2021)	*			*	
Andres, H. (2020)		*			*
Bailey, R. L. et al. (2020)			*	*	
Berssanette, J. H., & de Francisco, A. C. (2021)			*	*	
Borrego, M. et al. (2018)			*	*	
Bosio, G., & Origo, F. (2020)			*	*	
Cardozo, L. T. et al. (2020)			*	*	
Carstensen, S. S. et al. (2020)			*	*	
Cho, H. J. et al. (2021)			*	*	

Crisafio, A., & Cho, S. H. (2020)			*	*	
Guimaraes, L. M., & Lima, R. D. S. (2021)			*	*	
Handayani, P. W. et al. (2021)			*	*	
Hoyt, S. et al. (2020)			*	*	
Ismail, R. et al. (2020)		*		*	
Kopecki-Fjetland, M. A. (2019)			*	*	
Lamon, S. et al. (2020)			*	*	
Lugosi, E., & Uribe, G. (2022)			*	*	
Macleod, J. et al. 2019)			*	*	
Marcela Hernandez et al. (2019)			*	*	
Nguyen, K. A. et al. (2021)			*	*	
Patil, S. S., & Dharwadkar, N. V. (2020)			*	*	
Riedl et al. (2021)			*	*	
Rincon-F, E. G., & Santos-G, B. N. (2021)		*		*	
Shi, Y. et al. (2020)			*	*	
Shroff, R. H. et al. (2021)			*	*	
Sinnayah, P. et al. (2019)			*	*	
Situmorang, M. et al. (2020)		*		*	
Sumanasekera, W. et al. (2020)			*	*	
Tobin, R. G. (2018)			*	*	
Zawawi, W. W. M. et al. (2019)			*	*	
Zimanyi, M. A. et al. (2019)			*	*	
Total	1	5	28	33	1

3.2. Active Learning Benefits

Table 3 depicts all benefits that come under the cognitive, affective, and psychomotor categories. In total, 34 of the 45 studies were identified as cognitive (33 studies), affective (12 studies), and psychomotor (17 studies). The cognitive category recorded the highest frequency of studies because 26 cognitive studies were the dominant about improving student academic performance. All studies in these cognitive, affective, and psychomotor categories are directly related to active learning without utilizing additional factors as moderators and mediators. Overall, there are 6 cognitive-related benefits, namely “improved student academic performance,” “good memorization,” “improved student knowledge,” “improved achievement,” “critical thinking,” and “improved student understanding.” As for the affective category, the 4 cognitive-related benefits identified include “self-confidence,” “improved self-efficacy,” “high motivation,” and “positive learning experience.” The psychomotor category constitutes three benefits: “increased student participation,” “collaborative learning,” and “good communication skills.”

Table 3. Previous research on the cognitive, affective, and psychomotor benefits of active learning

Authors / Benefits	COGNITIVE	AFFECTIVE	PSYCHOMOTOR
	Improved academic performance		
Good memorization			
Increased student knowledge			
Increased student achievement			
Critical thinking			
Improved student understanding			
Self-confidence			
Enhanced self-efficacy			
High motivation			
Positive learning experience			
Increased student participation			
Collaborative learning			
Good communication skills			

Adams, C., & Dove, A. (2018)		*		*				*		*		*	
Aji, C. A., & Khan, M. J. (2019)	*			*					*		*		
Al-Amri, M. (2018)			*	*		*							
Alogiliy, M. et al. (2021)				*									
Andres, H. (2020)	*	*					*	*					
Bailey, R. L. et al. (2020)	*											*	
Berssanette, J. H., & de Francisco, A. C. (2021)	*								*	*			
Borrego, M. et al. (2018)								*	*			*	
Bosio, G., & Origo, F. (2020)	*												
Cardozo, L. T. et al. (2020)	*			*					*				
Carstensen, S. S. et al. (2020)	*		*	*		*							
Cho, H. J. et al. (2021)	*			*						*	*		
Crisafio, A., & Cho, S. H. (2020)	*			*									
Guimaraes, L. M., & Lima, R. D. S. (2021)	*												
Handayani, P. W. et al. (2021)	*								*		*		
Hoyt, S. et al. (2020)	*		*	*								*	
Ismail, R. et al. (2020)	*								*			*	
Kopecki-Fjetland, M. A. (2019)						*							
Lamon, S. et al. (2020)	*			*	*							*	
Lugosi, E., & Uribe, G. (2022)	*			*							*	*	
Macleod, J. et al. 2019)				*							*		
Marcela Hernandez et al. (2019)	*			*								*	
Nguyen, K. A. et al. (2021)	*												
Patil, S. S., & Dharwadkar, N. V. (2020)	*								*		*	*	
Riedl et al. (2021)	*			*							*		
Rincon-Flores, E. G., & Santos-Guevara, B. N. (2021)	*								*		*	*	
Shi, Y. et al. (2020)			*										
Shroff, R. H. et al. (2021)						*			*		*		
Sinnayah, P. et al. (2019)	*			*							*		
Situmorang, M. et al. (2020)	*		*										
Sumanasekera, W. et al. (2020)	*					*	*				*	*	
Tobin, R. G. (2018)	*												
Zawawi, W. W. M. et al. (2019)	*		*	*									
Zimanyi, M. A. et al. (2019)	*			*									
Total	25	2	6	17	3	4	1	3	9	3	15	5	2

3.3. Active Learning Challenges

Table 4 shows a summary of the results of past studies on the challenges in active learning. Overall, a total of 21 factors from 34 previous studies were identified. Subsequently, these factors are broken down into three groups according to the main categories, namely student factors, teacher factors, and pedagogical factors.

Table 4. Previous research on active learning challenges (2018-2021)

Challenges/ Authors	Adams, C., & Dove, A. (2018)	Aji, C. A., & Khan, M. J. (2019)	Al-Amri, M. (2018)	Alogilly, M. et al. (2021)	Andres, H. (2020)	Bailey, R. L. et al. (2020)	Bosio, G., & Origo, F. (2020)	Cardozo, L. T. et al. (2020)	Carstensen, S. S. et al. (2020)	Cho, H. J. et al. (2021)	Crisafio, A., & Cho, S. H. (2020)	Guimaraes, L. M., & Lima (2021)	Hoyt, S. et al. (2020)	Kopecki-Fjetland, M. A. (2019)	Macleod, J. et al. 2019)	Marcela Hernandez et al. (2019)	Patil, S. S., & Dharwadkar (2020)	Riedl et al. (2021)	Shi, Y. et al. (2020)	Shroff, R. H. et al. (2021)	Zawawi, W. W. M. et al. (2019)	Total
STUDENT FACTORS																						
Time constraints	*	*				*					*		*	*		*		*				8
Technology				*											*				*			3
Workload								*														1
Interest																				*		1
Background knowledge			*	*										*						*		4
Student participation									*	*		*							*			4
TEACHER FACTORS																						
Time constraints						*								*								2
Background knowledge					*							*								*		3
Teaching strategies							*	*							*		*		*			4
Teaching competence	*			*			*	*												*		4
PEDAGOGICAL FACTORS																						
Classroom size									*			*				*						3
Difficult content									*													1
Time table												*										1

These challenges can be categorized into internal and external challenges in active learning. The category of student factors in this study is defined as the obstacles that students face, that influence their active learning. Past researchers have explored six student factors: time constraints (8 studies), technology (3 studies), workload (1 study), interest (1 study), existing knowledge (4 studies), and student participation (4 studies).

The category of teacher factors can be defined as the obstacles teachers face that can influence active learning. There are four factors in this category: time constraints (2 studies), existing knowledge (3 studies), teaching strategies (4 studies), and teaching competency (4 studies).

The pedagogical category constitutes external factors that influence active learning. This category is the least important of the two categories examined by past researchers, with three factors that include classroom size (3 studies), difficult subject content (1 study), and timetable (1 study).

4. Discussion

This research discovers various benefits and challenges that can influence active learning among students and teachers, either directly or indirectly, relying on the systematic literature review. The study can be categorized into three groups, namely population target, benefits and challenges by characteristics, as well as similarities of originally recognized aspects. The presence of increasingly popular effects over other effects, according to the study's findings, is one of the intriguing topics to debate. Thus, it would be interesting to know more about the popular and dominant benefits in studies on active learning, which influences student learning. Compared to others, the benefit and challenge with the highest frequency and dominance constitute "improved student performance" and "time constraints," respectively. The number of studies on active learning presented and experimentally assessed has increased significantly in recent years, contributing to this result. Moreover, the respective benefits and challenges encompass 80% of all the identified past studies. Hence, this discussion will contribute to the literature by focusing on these two points.

Improved student academic performance is the most prominent as well as commonly assessed benefit. Among the reasons why the benefit is so prevalent in active learning, studies the cognitive domain which is the most studied issue and involves students' active learning. As a result, it stands to reason that the cognitive domain is among the most often utilized concepts in the active learning context. In addition, the cognitive domain is usually perceived as one of the primary aspects that successfully improve academic performance (Harris & Bacon, 2019). In particular, several scholars also established that active learning is among the primary aspects that promote the improvement of academic performance among students (Aji & Khan, 2019); (Bailey et al., 2020); (Cho et al., 2021); (Lugosi & Uribe, 2022). These researchers consider the active learning method the best method for improving students' understanding of learning something, which further leads to improved academic performance. Such a view increases the factor of academic performance as a critical component in active learning. Additionally, the relationship between academic performance and active learning may be the reason why the academic performance factor is highly dominant in this study.

In the subject of Mathematics, for example, the cognitive domain emphasizing the improvement of student academic performance is a preferred and recurring theme (Thian & Mohd Matore, 2021). A study (Ling, 2016) has demonstrated that active learning enhances student performance in mathematics, engineering, as well as science subjects. This has indirectly attracted the attention of researchers to examine whether academic performance in the context of active learning is an important aspect.

Time constraint is the student factor with the highest frequency in the studies of active learning challenges. Additionally, students believe that active learning costs time and resources (Welsh, 2012). For instance, students might not have sufficient time to study or maybe juggling several tasks at once. Moreover, they possess an inadequate amount of knowledge about learning participation in the classroom and struggle to actively make the most of the allotted time (Leksuwanakun et al., 2022). Students will also be discouraged when the activities they have planned cannot be completed on time due to time constraints (Heong et al., 2016).

A study by (Vodovozov et al., 2021) has shown that student failure in active learning depends on the time spent doing an activity in the classroom. This shows that the time constraints faced by students are a vital dimension that necessitates educational focus. Furthermore, it is prevalently acknowledged that most active learning researchers select this topic given the difficulty of students' time limits predicated on prior research. Thus, the combination of important challenges (e.g., time constraints) and new areas (active learning) will undoubtedly contribute useful and valuable knowledge to the education system.

5. Conclusion

This research attempts to comprehensively determine the factors, particularly during the present 10 years study period, that affect students' active learning. There was 34 research in all, divided into three categories: population target, benefits, and challenges. Ultimately, it may be said that several factors interact to affect students' active learning. In conclusion, our research identified two benefits that appeared most frequently in active learning. To offer some insights and contributions to additional information and knowledge in upcoming active learning research, the significance and relevance of increased student performance and the time restrictions in students' active learning were succinctly explained.

Undoubtedly, the benefit improvement of student academic performance is dominant in this study. However, its importance in active learning remains understudied as well as entitles greater emphasis. Comparatively speaking to the populations included, 26 studies from throughout the globe in the previous 10 years is not a sizable quantity. This demonstrates the need for more study on students' active learning. Consequently, a more thorough investigation is required since there are still a lot of undiscovered aspects, particularly when comparing teachers and education to other sectors.

This study is expected to give some ideas to scholars to expand this knowledge, particularly in the Malaysian context. Furthermore, this research is also anticipated to inform the benefits of students' active learning over the past ten years for stakeholders to improve active learning among educators and students, particularly teachers. Active learning is an important method to be improved by students and teachers in today's fast-paced world of education and education reform so that education remains relevant in achieving the goals that have been set.

6. Recommendations

It is advised that additional in-depth investigation is performed in additional research to comprehend the significance of the benefits and challenges found in the present research. Additionally, it is crucial to extensively investigate if these effects directly function as moderators and mediators of students' active learning to conduct the proper measures and advance the knowledge area. Future scholars will also be able to investigate more profound consequences by conducting in-depth interviews with pertinent specialists, reading publications written in other languages, and utilizing a larger database.

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