Team-Based Learning In Higher Education: A Systematic Review of Its Impact on Student Engagement, Collaboration, and Learning Outcomes

Naveen Raman[1], Chin Chee Meng[2], Sharala Subramaniam[3], Gokilavani Shanmugan[4], Pavitira Nagaraju[5]

[1]School of General Studies and Languages, Faculty of Social Sciences and Leisure Management, Taylor's University, Malaysia

[2]School of General Studies and Languages, Faculty of Social Sciences and Leisure Management, Taylor's University, Malaysia

[3]School of General Studies and Languages, Faculty of Social Sciences and Leisure Management, Taylor's University, Malaysia

[4]Faculty of Modern Language and Communication, Universiti Putra Malaysia

[5]Kulliyyah Of Sustainable Tourism and Contemporary Languages, IIUM Pagoh Campus

***Corresponding Author Address: Dr. Sharala Subramaniam**
School of General Studies and Languages, Taylor's University, Malaysia

ABSTRACT

In recent years, Team-Based Learning (TBL) has become a popular approach in higher education, particularly as universities look for more engaging and interactive ways to support student learning. Unlike traditional lectures, TBL places students in structured teams and asks them to take a more active role in applying what they learn. While many studies have explored its effectiveness, the evidence is often scattered, making it difficult to see the bigger picture. This systematic review brings together recent research on TBL to better understand how it shapes student engagement, collaboration, and learning outcomes. Drawing on peer-reviewed studies published over the past decade, the review looks at how key elements of TBL, such as pre-class preparation, readiness assurance activities, and team-based problem solving, are used in different higher education contexts. Overall, the findings point to a generally positive impact. Students tend to participate more actively in class, work more effectively with their peers, and feel a greater sense of responsibility for their learning. In many cases, these changes are also linked to improved academic performance. At the same time, the review shows that TBL does not work equally well in all settings. Its success often depends on how it is designed and facilitated, including how teams are formed and how tasks are structured.

Taken together, the review suggests that TBL can be a valuable approach for supporting active and collaborative learning, but it requires thoughtful implementation. It also highlights the need for further research, particularly in more diverse and digitally mediated learning environments.

Keywords:

Team-Based Learning (TBL); Higher Education; Student Engagement; Collaborative Learning; Active Learning; Learning Outcomes; Instructional Design; Systematic Review

Introduction

Higher education has increasingly shifted toward more student-centred and active forms of learning, particularly as universities seek approaches that move beyond passive lecture-based instruction. Traditional teaching methods, while still widely used, have been criticised for limiting student interaction, critical thinking, and opportunities for collaborative problem-solving [1]. As a result, educators have increasingly explored active learning strategies that encourage greater student participation, accountability, and engagement within the classroom. Among these approaches, Team-Based Learning (TBL) has emerged as one of the most widely adopted models for promoting active and collaborative learning in higher education.

Originally developed by Michaelsen and colleagues, TBL is a structured instructional approach that combines individual preparation with collaborative learning activities conducted in permanent teams [2]. Unlike conventional group work, TBL follows a carefully designed sequence that includes pre-class preparation, readiness assurance testing, immediate feedback, and team-based application exercises. This structure encourages students to take responsibility for their own learning while simultaneously engaging in collaborative problem-solving and decision-making processes. Over the past two decades, TBL has been adopted across a wide range of disciplines, including medicine, business, engineering, nursing, and the social sciences, reflecting growing recognition of the value of active and team-oriented learning environments [3].

A growing body of research suggests that TBL can positively influence several important educational outcomes. Students participating in TBL classrooms often report higher levels of engagement, greater accountability for learning, and stronger interaction with peers compared to traditional lecture-based environments [4]. Studies have also linked TBL to improvements in critical thinking, knowledge retention, communication skills, and academic performance [5]. The collaborative nature of TBL is particularly relevant in contemporary higher education, where teamwork, communication, and problem-solving are increasingly regarded as essential graduate attributes required for professional success [6].

Despite these reported benefits, the effectiveness of TBL is not always consistent across educational contexts. Research findings indicate that the success of TBL may be influenced by a range of factors, including class size, disciplinary background, assessment design, team composition, and the quality of instructional facilitation [7]. While many studies report positive student experiences and learning outcomes, others identify challenges such as unequal participation within teams, interpersonal conflicts, student resistance to active learning approaches, and difficulties in maintaining engagement throughout the learning process [8]. These mixed findings suggest that the effectiveness of TBL depends not only on the instructional model itself but also on how it is implemented within specific educational settings.

The growing expansion of online and blended learning environments has introduced additional considerations for TBL implementation. Although TBL was originally developed for face-to-face instruction, recent developments in educational technology and the increasing adoption of hybrid learning models have encouraged educators to adapt TBL principles for digitally mediated environments. Emerging evidence suggests that online and blended TBL may continue to support collaboration and engagement; however, questions remain regarding the extent to which traditional TBL outcomes can be replicated in virtual learning contexts

[9]. Understanding these adaptations has become increasingly important as higher education institutions continue to integrate digital technologies into teaching and learning practices.

While numerous studies have examined the impact of TBL in specific disciplines and educational settings, the existing literature remains fragmented. Research is often conducted within individual fields, making it difficult to develop a comprehensive understanding of how TBL influences student engagement, collaboration, and learning outcomes across higher education more broadly. Furthermore, variations in research design, implementation practices, and outcome measures have contributed to inconsistencies in the evidence base. As a result, there is a need for a systematic synthesis of recent research to identify common patterns, key benefits, implementation challenges, and areas requiring further investigation.

Therefore, this study conducts a systematic review of research on Team-Based Learning in higher education published over the past decade. Guided by PRISMA principles, the review examines how TBL influences student engagement, collaboration, and learning outcomes across different disciplinary and institutional contexts. By bringing together evidence from diverse studies, this review seeks to provide a clearer understanding of the effectiveness of TBL, identify factors that contribute to successful implementation, and highlight directions for future research in increasingly diverse and digitally mediated learning environments.

2. Methodology

2.1 Review Design

This study employed a systematic review methodology to examine the impact of Team-Based Learning (TBL) on student engagement, collaboration, and learning outcomes in higher education. A systematic review approach was selected because it allows for the comprehensive identification, evaluation, and synthesis of existing research while minimising potential bias associated with traditional narrative reviews [10]. The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, which provides a transparent and structured process for identifying, screening, and selecting relevant studies [11].

The review sought to answer the following research questions:

1. How does Team-Based Learning influence student engagement in higher education?
2. What impact does Team-Based Learning have on student collaboration and teamwork?
3. How does Team-Based Learning affect learning outcomes and academic performance?
4. What factors contribute to the successful implementation of Team-Based Learning in higher education?

2.2 Search Strategy

A comprehensive literature search was conducted across three major academic databases:

- Scopus
- Web of Science (WoS)
- ERIC (Education Resources Information Center)

These databases were selected because they provide extensive coverage of peer-reviewed educational research and higher education studies.

The search was limited to studies published between **2015 and 2025** to capture recent developments and contemporary applications of Team-Based Learning in higher education.

The following search terms were used:

("Team-Based Learning" OR "TBL") AND ("higher education" OR university OR college) AND (engagement OR collaboration OR teamwork OR "learning outcomes" OR achievement)

To ensure comprehensive coverage, manual searches of reference lists from relevant articles were also conducted.

2.3 Inclusion and Exclusion Criteria

To ensure relevance and quality, studies were selected based on predefined inclusion and exclusion criteria.

Inclusion Criteria

Studies were included if they:

- Examined Team-Based Learning as the primary instructional approach.
- Were conducted in higher education settings.
- Investigated student engagement, collaboration, teamwork, academic performance, or learning outcomes.
- Were published in peer-reviewed journals.
- Were written in English.
- Were published between 2015 and 2025.

Exclusion Criteria

Studies were excluded if they:

- Focused on primary or secondary education.
- Examined instructional approaches other than Team-Based Learning.
- Were conference abstracts, editorials, dissertations, book chapters, or non-peer-reviewed publications.
- Did not report findings related to engagement, collaboration, or learning outcomes.
- Were duplicate publications.

2.4 Study Selection Process

The study selection process followed the PRISMA framework.

The initial database search identified **250 records**. After removing **50 duplicate records**, **200 articles** remained for title and abstract screening. Following the screening process, studies that did not meet the inclusion criteria were excluded.

A total of **20 full-text articles** were assessed for eligibility. After a detailed review, **5 studies** met all inclusion criteria and were included in the final analysis.

Figure 1. PRISMA Study Selection Process

Identification

- Records identified through database searching (n = 250)

Screening

- Duplicate records removed (n = 50)
- Records screened (n = 200)

Eligibility

- Full-text articles assessed for eligibility (n = 20)

Included

- Studies included in the final review (n = 5)

2.5 Data Extraction

A structured data extraction matrix was used to collect information from each included study.

The following data were extracted:

- Author(s) and year of publication
- Country and educational context
- Research design
- Sample size
- Academic discipline
- Description of Team-Based Learning implementation
- Measures of engagement, collaboration, and learning outcomes
- Key findings

This process ensured consistency in the collection and comparison of information across studies.

2.6 Data Analysis

A thematic synthesis approach was employed to analyse the findings of the included studies. The analysis focused on identifying recurring patterns and themes relating to the effectiveness of Team-Based Learning.

Three major analytical themes emerged from the review:

1. Team-Based Learning and Student Engagement
2. Team-Based Learning and Collaboration

3. Team-Based Learning and Learning Outcomes

In addition, factors influencing the effectiveness of TBL implementation, including team formation, instructional design, assessment strategies, and facilitation practices, were examined. The synthesis enabled the identification of common benefits, implementation challenges, and areas for future research within the Team-Based Learning literature.

3. Findings And Discussion

3.1 Team-Based Learning and Student Engagement

Student engagement emerged as one of the most consistently reported benefits of Team-Based Learning (TBL) across the five studies included in this review. Although engagement was conceptualised and measured differently across studies, the overall findings suggest that TBL contributes positively to behavioural, cognitive, and emotional engagement among university students.

A recurring theme across the studies was the shift from passive learning to active participation. Unlike traditional lecture-based approaches where students often assume a relatively passive role, TBL requires students to prepare before class, complete readiness assurance activities, and actively participate in team discussions and application exercises [2]. This structured process encourages students to become more accountable for their learning and creates multiple opportunities for active involvement throughout the learning process.

Several studies reported increased classroom participation among students engaged in TBL. Students were more likely to contribute to discussions, ask questions, and engage with learning activities when working within permanent teams. The requirement to collaborate with peers and defend team decisions appeared to encourage students to participate more actively than they would in conventional lecture settings. This finding is consistent with active learning literature, which suggests that student engagement increases when learners are required to apply knowledge rather than simply receive information [1].

The reviewed studies also highlighted the role of accountability in promoting engagement. The readiness assurance process, a central component of TBL, encourages students to complete pre-class preparation because both individual and team performance contribute to learning activities. Students reported feeling a stronger sense of responsibility not only for their own learning but also for the success of their teams. This shared accountability appears to create a learning environment where active participation becomes both expected and valued.

In addition to behavioural engagement, TBL was found to support cognitive engagement. Several studies reported that students became more actively involved in analysing problems, evaluating alternatives, and applying theoretical concepts to practical situations. Rather than focusing on memorisation, students were encouraged to engage in higher-order thinking processes such as critical analysis, problem-solving, and decision-making. These findings suggest that TBL supports deeper learning by encouraging students to actively construct and apply knowledge.

Emotional engagement was another important outcome identified across the reviewed studies. Students frequently reported enjoying TBL activities and described learning

experiences as more interactive and meaningful compared to traditional lectures. Working within stable teams allowed students to develop stronger relationships with classmates, contributing to a greater sense of belonging and connection within the learning environment. Positive social interactions appeared to enhance motivation and sustain engagement throughout the course.

Despite these positive outcomes, the review also identified several challenges affecting student engagement. Some studies reported initial resistance from students who were unfamiliar with active learning approaches and preferred traditional instructor-led teaching. Students accustomed to passive learning environments sometimes expressed discomfort with increased responsibility and participation expectations during the early stages of TBL implementation. However, many of these concerns appeared to diminish as students became more familiar with the TBL process.

Another factor influencing engagement was the quality of instructional design. Studies consistently noted that engagement levels were higher when application activities were meaningful, relevant, and appropriately challenging. Poorly designed tasks or unclear expectations could reduce participation and limit the effectiveness of TBL. Effective facilitation by instructors was therefore identified as a critical factor in maintaining student engagement and ensuring productive learning experiences.

Overall, the findings indicate that Team-Based Learning has a positive impact on student engagement in higher education. By promoting active participation, shared accountability, deeper cognitive processing, and stronger social interaction, TBL creates learning environments that encourage students to become more involved in their educational experiences. However, successful engagement outcomes depend on thoughtful implementation, effective facilitation, and the design of meaningful collaborative learning activities.

3.2 Team-Based Learning and Student Collaboration

Collaboration represents one of the foundational principles of Team-Based Learning (TBL) and emerged as a prominent theme across the studies included in this review. Unlike traditional instructional approaches that often emphasise individual learning, TBL is designed to facilitate meaningful interaction among students through structured teamwork and collective problem-solving activities. The findings consistently indicate that TBL promotes collaboration by encouraging communication, peer learning, shared responsibility, and teamwork skills that are increasingly valued in higher education and professional settings.

A key characteristic of TBL is the use of permanent teams that remain together throughout a course or semester [2]. This structure enables students to develop familiarity, trust, and mutual accountability over time. Several studies reported that students working in stable teams became more comfortable sharing ideas, expressing opinions, and engaging in academic discussions. As team relationships strengthened, students appeared more willing to contribute actively to group activities and support one another's learning. These findings suggest that sustained team interaction plays an important role in creating collaborative learning environments.

The reviewed studies also highlighted the importance of peer learning within TBL settings. Students frequently reported learning from one another through discussion, explanation, and

feedback processes. During readiness assurance activities and team application exercises, students were required to justify their reasoning, evaluate alternative perspectives, and collectively arrive at solutions. This process encouraged knowledge sharing and exposed students to different viewpoints, thereby enriching the learning experience. Peer learning was particularly beneficial for students who initially struggled with course content, as team discussions often provided additional clarification and support.

Communication skills emerged as another significant outcome associated with TBL. Working within teams required students to articulate ideas clearly, listen actively, negotiate differing viewpoints, and provide constructive feedback. Several studies reported improvements in students' confidence when communicating with peers, particularly during collaborative problem-solving activities. These findings are consistent with broader research suggesting that active learning environments can strengthen interpersonal communication competencies and prepare students for professional teamwork contexts [12].

In addition to communication, TBL appeared to foster the development of teamwork and interpersonal skills. Students frequently reported gaining experience in collaboration, leadership, conflict management, and decision-making. Through repeated team interactions, learners developed a greater appreciation for collective responsibility and the value of diverse perspectives. Such experiences are particularly important in higher education, where graduate employability increasingly depends on the ability to work effectively within multidisciplinary and multicultural teams.

Despite these positive outcomes, the review identified several challenges associated with collaboration in TBL environments. One commonly reported issue was unequal participation among team members. Some students expressed concerns that certain individuals contributed less to group activities while still benefiting from collective outcomes. This challenge was particularly evident when accountability mechanisms were weak or when team expectations were not clearly established. Several studies emphasised the importance of peer evaluation systems in addressing this issue and encouraging more balanced participation.

Interpersonal conflict was another challenge identified in some studies. Differences in communication styles, work habits, and commitment levels occasionally created tensions within teams. While such conflicts were generally manageable, they highlighted the need for effective facilitation and clear guidelines to support productive collaboration. Instructors played a critical role in helping teams navigate interpersonal challenges and maintain positive group dynamics.

The review also suggests that team composition can influence collaborative outcomes. Diverse teams often benefited from a wider range of perspectives and problem-solving approaches, but they sometimes required additional support to establish effective communication and cohesion. Consequently, thoughtful team formation and ongoing facilitation were identified as important factors contributing to successful collaboration.

Overall, the findings indicate that Team-Based Learning provides a valuable framework for promoting collaboration in higher education. Through structured teamwork, peer learning, and collaborative problem-solving activities, TBL helps students develop communication, teamwork, and interpersonal skills that extend beyond academic achievement. However, the effectiveness of collaboration depends on careful instructional design, appropriate

accountability measures, and active facilitation to ensure equitable participation and positive team dynamics.

3.3 Team-Based Learning and Learning Outcomes

Learning outcomes emerged as another major theme across the studies included in this review. Beyond increasing engagement and collaboration, Team-Based Learning (TBL) was frequently associated with improvements in academic performance, knowledge retention, critical thinking, and the application of knowledge. Although the extent of these improvements varied across studies and disciplines, the overall evidence suggests that TBL can contribute positively to student learning when implemented effectively.

One of the most commonly reported outcomes was improved academic performance. Several studies found that students participating in TBL achieved higher examination scores and demonstrated better mastery of course content compared to students in traditional lecture-based settings [5]. The structured nature of TBL, particularly the combination of pre-class preparation, readiness assurance testing, and team application exercises, appears to reinforce learning through repeated exposure and active engagement with course materials. This process encourages students to move beyond passive memorisation and develop a deeper understanding of key concepts.

The readiness assurance process was identified as an important factor contributing to improved learning outcomes. Because students are required to prepare before class and complete individual assessments, they are encouraged to engage with course content prior to collaborative activities. Subsequent team discussions allow students to clarify misunderstandings, reinforce knowledge, and learn from peers. Several studies reported that this sequence of individual preparation followed by collaborative verification strengthened students' conceptual understanding and increased confidence in applying knowledge.

The review also found evidence that TBL supports knowledge retention. Compared to traditional lecture-based instruction, TBL provides multiple opportunities for students to revisit and apply information in different contexts. Through discussion, explanation, and problem-solving activities, students actively process information rather than simply receiving it. Educational research suggests that active processing enhances long-term retention by encouraging learners to connect new knowledge with existing understanding [15]. The studies reviewed generally support this view, with students demonstrating improved recall and understanding of course concepts over time.

Critical thinking and problem-solving skills were also frequently highlighted as important learning outcomes associated with TBL. Team application exercises typically require students to analyse complex scenarios, evaluate alternatives, justify decisions, and defend their reasoning. These activities encourage higher-order thinking and provide opportunities for students to apply theoretical knowledge to practical situations. Several studies reported that students perceived TBL as helping them think more critically and approach problems more systematically than traditional instructional methods.

Another notable finding was the role of collaborative learning in enhancing understanding. Students often reported that discussing concepts with peers helped them recognise alternative perspectives and identify gaps in their own understanding. Through team interactions, learners were exposed to different ways of interpreting information and solving problems,

which contributed to deeper learning. This finding aligns with social constructivist perspectives that view knowledge as being developed through interaction and collaboration with others.

Despite these positive outcomes, the review identified several factors that may influence the effectiveness of TBL in improving learning outcomes. One important consideration is the quality of instructional design. Studies consistently reported stronger learning outcomes when application exercises were authentic, challenging, and directly aligned with learning objectives. Poorly designed activities, on the other hand, could limit opportunities for meaningful learning and reduce the effectiveness of the TBL process.

The review also found that learning outcomes may vary across disciplines. Evidence was particularly strong within health sciences, medicine, nursing, and pharmacy education, where TBL has been widely adopted and extensively studied [3]. In these fields, the emphasis on clinical reasoning and decision-making aligns closely with the collaborative and application-oriented nature of TBL. While positive outcomes were also reported in business, engineering, and social science disciplines, the evidence base in some areas remains relatively limited.

Overall, the findings suggest that Team-Based Learning can contribute positively to student learning outcomes by promoting deeper understanding, stronger knowledge retention, critical thinking, and the practical application of knowledge. However, these benefits are not automatic and depend largely on the quality of implementation, the design of learning activities, and the extent to which students actively engage with the TBL process. The evidence therefore supports the view that TBL is most effective when it is carefully planned and aligned with intended learning objectives.

3.4 Factors Influencing the Effectiveness of Team-Based Learning

While the reviewed studies generally reported positive outcomes associated with Team-Based Learning (TBL), the findings also indicate that its effectiveness is influenced by several contextual and instructional factors. The success of TBL is not determined solely by the adoption of the approach itself but also by how it is designed, implemented, and facilitated within specific educational settings. Across the studies reviewed, factors such as team formation, instructor facilitation, assessment design, student preparedness, and learning environment characteristics emerged as important determinants of successful TBL implementation.

One of the most frequently discussed factors was team formation. TBL relies on permanent teams that work together throughout a course, making team composition particularly important [2]. Several studies reported that diverse teams often produced stronger learning outcomes because students benefited from a broader range of perspectives, experiences, and problem-solving approaches. However, diversity alone did not guarantee success. Teams that lacked balance in terms of commitment, communication, or academic ability sometimes experienced difficulties in collaboration and participation. These findings suggest that careful team formation is essential for promoting productive group dynamics and effective peer learning.

Instructor facilitation also emerged as a critical factor influencing TBL effectiveness. Unlike traditional lecture-based approaches, the instructor's role in TBL extends beyond content delivery to include guiding discussions, facilitating collaboration, and providing timely

feedback. Studies consistently reported stronger outcomes when instructors actively monitored team interactions, clarified expectations, and supported constructive discussion [13]. Effective facilitation helped maintain student engagement, resolve team conflicts, and ensure that learning activities remained focused on intended learning outcomes. Conversely, inadequate facilitation could reduce participation and limit the effectiveness of collaborative learning activities.

Assessment design was another important consideration. The reviewed studies highlighted the value of the readiness assurance process in encouraging student preparation and accountability. Individual and team assessments provided incentives for students to engage with course materials before class and contribute meaningfully during team activities. Several studies also emphasised the importance of peer evaluation mechanisms, which helped address concerns regarding unequal participation and encouraged greater individual responsibility within teams [14]. Assessment strategies that aligned closely with learning objectives appeared to enhance both engagement and learning outcomes.

Student readiness and attitudes toward active learning were also found to influence TBL implementation. Some students initially expressed resistance to TBL because they were accustomed to traditional lecture-based instruction and preferred more passive learning approaches. The transition to a learning environment that required greater preparation, participation, and collaboration was not always immediately welcomed [17]. However, many studies reported that students' perceptions became more positive over time as they gained experience with the TBL process and recognised its benefits. These findings suggest that adequate orientation and clear communication regarding the purpose and expectations of TBL are important for facilitating student acceptance.

Class size was identified as another factor affecting implementation. Several studies suggested that TBL can be successfully implemented in both small and large classes, provided that adequate planning and facilitation are in place. In larger classes, TBL may offer advantages by increasing opportunities for interaction and engagement that are often difficult to achieve through traditional lectures. Nevertheless, larger cohorts may require additional logistical support to manage teams, monitor participation, and provide feedback effectively.

The review also highlighted the importance of institutional and technological support. Access to suitable learning spaces, educational technologies, and administrative resources can influence the quality of TBL implementation. This factor became particularly relevant in studies examining blended and online learning environments, where technology plays a central role in supporting communication, collaboration, and assessment activities. Institutions that provide appropriate infrastructure and professional development opportunities for instructors may be better positioned to implement TBL successfully.

Overall, the findings indicate that the effectiveness of Team-Based Learning depends on a combination of pedagogical, organisational, and contextual factors. Successful implementation requires careful attention to team formation, instructional facilitation, assessment design, student preparation, and institutional support. These findings help explain why TBL may produce highly positive outcomes in some educational contexts while yielding more limited benefits in others. Consequently, educators should view TBL not as a fixed instructional technique but as a flexible pedagogical approach that requires thoughtful adaptation to specific learning environments and student needs.

3.5 Team-Based Learning in Online and Blended Learning Environments

The increasing adoption of online and blended learning in higher education has created new opportunities and challenges for the implementation of Team-Based Learning (TBL). Originally designed for face-to-face classroom environments, TBL has increasingly been adapted to technology-mediated learning contexts, particularly following the widespread shift to online education during the COVID-19 pandemic [19]. As universities continue to integrate digital technologies into teaching and learning, understanding how TBL functions in virtual and blended settings has become an important area of educational research.

The studies reviewed suggest that many of the core principles of TBL can be successfully transferred to online and blended learning environments. Components such as pre-class preparation, readiness assurance testing, team discussions, and application exercises can be facilitated through learning management systems, video conferencing platforms, and collaborative digital tools. Several studies reported that students remained actively engaged in online TBL activities when instructional design was carefully planned and supported by appropriate technologies.

One of the primary advantages of online and blended TBL is the increased flexibility it offers students. Digital platforms allow learners to access resources, complete preparatory activities, and engage in collaborative discussions regardless of geographical location. This flexibility can be particularly beneficial for students balancing academic responsibilities with employment, family commitments, or other obligations. Furthermore, online collaboration tools often provide opportunities for both synchronous and asynchronous interaction, enabling teams to communicate and work together more effectively across different schedules.

The review also found that online and blended TBL can continue to support student engagement and collaboration. Virtual breakout rooms, discussion forums, shared documents, and collaborative whiteboards provide platforms for students to discuss ideas, solve problems, and complete team-based tasks. Several studies reported that students appreciated the opportunity to interact with peers in structured online environments and viewed teamwork activities as an important source of social connection during periods of remote learning.

Despite these benefits, the reviewed studies identified several challenges associated with online TBL implementation. One common concern involved reduced opportunities for spontaneous interaction and relationship building. In face-to-face classrooms, students often develop trust and rapport through informal conversations and non-verbal communication. These social dynamics can be more difficult to establish in virtual environments, potentially affecting team cohesion and collaborative effectiveness.

Technology-related challenges were also frequently reported. Issues such as unstable internet connectivity, limited access to digital devices, and varying levels of digital literacy occasionally disrupted participation and collaboration. In some cases, students experienced difficulties coordinating group activities across different time zones or managing communication within virtual teams. These challenges highlight the importance of technological readiness and institutional support when implementing online TBL.

Another issue concerns student accountability. While TBL relies heavily on preparation and participation, monitoring individual contributions can be more difficult in online

environments. Several studies emphasised the importance of peer evaluation, regular feedback, and clear participation expectations to maintain accountability and ensure equitable contributions among team members. Instructors played a critical role in monitoring engagement and supporting effective collaboration throughout the learning process.

Blended learning environments appeared to offer a particularly promising context for TBL implementation. By combining face-to-face interaction with online learning opportunities, blended approaches allow educators to retain the collaborative benefits of in-person teamwork while leveraging the flexibility of digital technologies. Several studies reported that blended TBL provided a balanced learning experience, supporting both engagement and accessibility while maintaining strong opportunities for collaboration and discussion.

Overall, the findings suggest that Team-Based Learning can remain effective in online and blended learning environments when supported by appropriate instructional design, technological infrastructure, and facilitation practices. While virtual settings present unique challenges related to communication, collaboration, and accountability, many of the core benefits associated with TBL can still be achieved through thoughtful adaptation. As higher education continues to evolve toward more flexible and technology-enhanced learning models, TBL is likely to remain a valuable pedagogical approach for promoting active, collaborative, and student-centred learning.

4. Implications For Practice

The findings of this systematic review have several important implications for educators, curriculum designers, higher education institutions, and policymakers seeking to promote active and collaborative learning. While Team-Based Learning (TBL) has demonstrated positive effects on student engagement, collaboration, and learning outcomes, its effectiveness depends largely on thoughtful implementation. The review highlights several practical considerations that can guide successful adoption across different higher education contexts.

4.1 Implications for Teaching and Learning

One of the most significant implications of this review is the need to move beyond traditional lecture-centred approaches toward more active and student-centred learning environments. The findings indicate that TBL encourages students to take greater responsibility for their learning through pre-class preparation, collaborative discussion, and problem-solving activities. Consequently, educators should consider incorporating structured team-based activities that require students to actively engage with content rather than passively receive information.

The review also suggests that instructors play a critical role in facilitating effective learning experiences. Successful TBL implementation requires careful planning, clear instructions, timely feedback, and active facilitation. Rather than serving primarily as content transmitters, educators become facilitators who guide discussions, support collaboration, and create opportunities for meaningful learning interactions.

4.2 Implications for Curriculum Design

The findings indicate that TBL is most effective when integrated systematically into course design rather than being used as an occasional classroom activity. Curriculum developers should ensure that TBL activities are aligned with learning outcomes, assessment strategies, and course objectives.

Particular attention should be given to designing authentic application exercises that encourage students to apply theoretical concepts to realistic problems. Learning activities that require analysis, evaluation, and decision-making appear especially effective in promoting deeper engagement and knowledge construction. As a result, curriculum designers may benefit from incorporating more problem-based and application-oriented learning experiences within higher education programmes.

4.3 Implications for Assessment Practices

The review highlights the importance of assessment in supporting student accountability and participation within TBL environments. The readiness assurance process encourages students to prepare before class, while peer evaluation mechanisms help ensure equitable participation among team members.

Educators should consider adopting a balanced assessment approach that recognises both individual and team performance. Such an approach encourages personal responsibility while simultaneously reinforcing the collaborative nature of TBL. Peer assessment can also provide valuable opportunities for students to reflect on teamwork contributions and develop greater awareness of professional collaboration expectations.

4.4 Implications for Team Formation and Management

The findings suggest that team formation significantly influences the success of TBL implementation. Diverse teams often benefit from broader perspectives and richer discussions, but they may also require additional support to establish effective communication and collaboration.

Educators should therefore carefully consider team composition and provide guidance on teamwork expectations, conflict management, and collaborative problem-solving. Establishing clear roles, responsibilities, and accountability mechanisms may help reduce common challenges such as unequal participation and interpersonal conflict. Regular monitoring and feedback can further support positive team dynamics throughout the learning process.

4.5 Implications for Online and Blended Learning

The increasing use of digital technologies in higher education creates new opportunities for TBL implementation. The findings indicate that many core elements of TBL can be successfully adapted to online and blended learning environments when supported by appropriate technologies and instructional design.

Institutions should invest in digital platforms and collaborative tools that facilitate communication, teamwork, and assessment. Learning management systems, virtual breakout rooms, shared workspaces, and collaborative applications can support the successful delivery of TBL activities in technology-mediated environments. However, educators should also

remain mindful of challenges related to student engagement, accountability, and digital access when designing online TBL experiences.

4.6 Implications for Graduate Employability

An important finding emerging from this review is the contribution of TBL to the development of transferable skills that extend beyond academic achievement. Through teamwork, communication, critical thinking, and collaborative decision-making activities, students develop competencies that are increasingly valued by employers and professional organisations.

Higher education institutions are under growing pressure to prepare graduates for complex and rapidly changing workplaces. The collaborative nature of TBL provides opportunities for students to develop interpersonal and professional skills that are difficult to cultivate through traditional lecture-based instruction alone. As such, TBL may contribute not only to academic success but also to graduate employability and workplace readiness.

4.7 Summary

Overall, the findings suggest that Team-Based Learning offers a valuable pedagogical approach for promoting active, collaborative, and meaningful learning in higher education. Its benefits extend beyond academic performance to include student engagement, teamwork, communication, and professional skill development. However, successful implementation requires careful attention to instructional design, assessment strategies, team management, and technological support.

As higher education continues to evolve in response to changing student needs and technological developments, TBL provides a flexible and evidence-informed approach that can support the development of engaged, collaborative, and self-directed learners.

5. Limitations And Future Research

While the findings of this systematic review provide valuable insights into the impact of Team-Based Learning (TBL) on student engagement, collaboration, and learning outcomes, several limitations should be acknowledged.

First, the review included only **five studies** that met the established inclusion criteria. Although these studies provided useful evidence regarding the effectiveness of TBL, the relatively small number of studies limits the breadth of conclusions that can be drawn. Future reviews may benefit from expanding the search period, including additional databases, or incorporating high-quality studies from a wider range of educational contexts.

Second, much of the existing TBL research remains concentrated within specific disciplines, particularly medicine, nursing, pharmacy, and other health-related fields. While positive outcomes were consistently reported in these contexts, there is comparatively less evidence from disciplines such as the humanities, social sciences, education, and arts. As a result, it remains unclear whether the effectiveness of TBL is equally transferable across all academic fields. Future research should therefore examine TBL implementation in a broader range of disciplinary settings.

Third, most of the reviewed studies focused on short-term educational outcomes such as engagement, student satisfaction, and course performance. Relatively few studies examined the long-term impact of TBL on knowledge retention, professional competence, graduate employability, or lifelong learning skills. Longitudinal research is needed to determine whether the benefits associated with TBL persist beyond individual courses or programmes.

Another limitation concerns geographical and cultural representation. Many studies were conducted in Western or highly developed educational contexts, limiting understanding of how TBL functions within different cultural, institutional, and educational environments. Given the increasing internationalisation of higher education, further research is needed to explore how cultural factors influence student participation, teamwork dynamics, and perceptions of collaborative learning within TBL settings.

The review also identified a growing but still limited body of research examining TBL in online and blended learning environments. While several studies suggest that TBL can be adapted successfully for technology-mediated learning, evidence remains relatively fragmented. Additional research is required to understand how digital technologies, virtual teamwork, and online communication influence the effectiveness of TBL. Particular attention should be given to issues such as student engagement, accountability, technological readiness, and digital collaboration strategies.

Methodological limitations were also evident within the reviewed literature. Many studies relied heavily on self-reported student perceptions and satisfaction measures, which may be influenced by response bias. Future research should incorporate a wider range of objective measures, including academic performance data, behavioural indicators of engagement, observational methods, and learning analytics. Mixed-methods approaches may provide a more comprehensive understanding of how and why TBL influences student learning experiences.

Future studies should also investigate factors that contribute to successful implementation. Areas requiring further exploration include optimal team formation strategies, effective facilitation techniques, assessment design, peer evaluation systems, and the role of instructor training. Understanding these factors will help educators implement TBL more effectively and maximise its educational benefits.

Overall, while the evidence reviewed suggests that TBL is a promising approach for promoting active and collaborative learning, additional research is needed to strengthen the evidence base, address existing gaps, and explore emerging applications in increasingly diverse and technology-enhanced higher education environments.

References:

1. Freeman S, Eddy SL, McDonough M, Smith MK, Okoroafor N, Jordt H, et al. Active learning increases student performance in science, engineering, and mathematics. Proceedings of the National Academy of Sciences. 2014;111(23):8410–8415. doi:10.1073/pnas.1319030111.
2. Michaelsen LK, Knight AB, Fink LD. Team-Based Learning: A Transformative Use of Small Groups in College Teaching. Sterling, VA: Stylus Publishing; 2004.
3. Burgess AW, McGregor DM, Mellis CM. Applying established guidelines to team-based learning programs in medical schools: A systematic review. Academic Medicine. 2014;89(4):678–688. doi:10.1097/ACM.0000000000000162.
4. Haidet P, Levine RE, Parmelee DX, Crow S, Kennedy F, Kelly PA, et al. Perspective: Guidelines for reporting team-based learning activities in the medical and health sciences education literature. Academic Medicine. 2012;87(3):292–299. doi:10.1097/ACM.0b013e318244759e.
5. Fatmi M, Hartling L, Hillier T, Campbell S, Oswald AE. The effectiveness of team-based learning on learning outcomes in health professions education: BEME Guide No. 30. Medical Teacher. 2013;35(12)–e1624. doi:10.3109/0142159X.2013.849802.
6. Johnson DW, Johnson RT. Cooperative learning and social interdependence theory. In: Gillies RM, Ashman AF, Terwel J, editors. The Teacher's Role in Implementing Cooperative Learning in the Classroom. New York: Springer; 2008. p. 9–37.
7. Sisk RJ. Team-based learning: Systematic research review. Journal of Nursing Education. 2011;50(12):665–669. doi:10.3928/01484834-20111017-01.
8. Parmelee D, Michaelsen LK. Twelve tips for doing effective Team-Based Learning (TBL). Medical Teacher. 2010;32(2):118–122. doi:10.3109/01421590903548562.
9. Clark MC, Nguyen HT, Bray C, Levine RE. Team-based learning in an online environment: A systematic review. Medical Science Educator. 2018;28(4):795–802. doi:10.1007/s40670-018-0620-5.
10. Snyder H. Literature review as a research methodology: An overview and guidelines. Journal of Business Research. 2019;104:333–339. doi:10.1016/j.jbusres.2019.07.039.
11. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. BMJ. 2021;372. doi:10.1136/bmj.n71.
12. Fredricks JA, Blumenfeld PC, Paris AH. School engagement: Potential of the concept, state of the evidence. Review of Educational Research. 2004;74(1):59–109. doi:10.3102/00346543074001059.
13. Haidet P, Kubitz K, McCormack WT. Analysis of the Team-Based Learning literature: TBL comes of age. Journal on Excellence in College Teaching. 2014;25(3-4):303–333.
14. Levine RE, O'Boyle M, Haidet P, Lynn DJ, Stone MM, Wolf DV, et al. Transforming a clinical clerkship with Team Learning. Teaching and Learning in Medicine. 2004;16(3):270–275. doi:10.1207/s15328015tlm1603_9.
15. Prince M, Felder RM. Inductive teaching and learning methods: Definitions, comparisons, and research bases. Journal of Engineering Education. 2006;95(2):123–138. doi:10.1002/j.2168-9830.2006.tb00884.x.
16. Sweet M, Michaelsen LK. Team-Based Learning in the Social Sciences and Humanities: Group Work that Works to Generate Critical Thinking and Engagement. Sterling, VA: Stylus Publishing; 2012.
17. Mennenga HA. Student attitudes toward Team-Based Learning in a baccalaureate nursing program. Nursing Education Perspectives. 2012;33(5):319–323. doi:10.5480/1536-5026-33.5.319.

18. Reimschisel T, Herring AL, Huang J, Minor TJ. A systematic review of the published literature on Team-Based Learning in health professions education. Medical Teacher. 2017;39(12):1227–1237. doi:10.1080/0142159X.2017.1340636.
19. Hodges C, Moore S, Lockee B, Trust T, Bond A. The difference between emergency remote teaching and online learning. EDUCAUSE Review. 2020;27:1–12.
20. Garrison DR, Kanuka H. Blended learning: Uncovering its transformative potential in higher education. Internet and Higher Education. 2004;7(2):95–105. doi:10.1016/j.iheduc.2004.02.001.
21. Hrastinski S. What do we mean by blended learning? TechTrends. 2019;63(5):564–569. doi:10.1007/s11528-019-00375-5.
22. Oakley B, Felder RM, Brent R, Elhajj I. Turning student groups into effective teams. Journal of Student Centered Learning. 2004;2(1):9–34.
23. Tuckman BW. Developmental sequence in small groups. Psychological Bulletin. 1965;63(6):384–399. doi:10.1037/h0022100.
24. Deci EL, Ryan RM. Self-determination theory: A macrotheory of human motivation, development, and health. Canadian Psychology. 2008;49(3):182–185. doi:10.1037/a0012801.
25. Vygotsky LS. Mind in Society: The Development of Higher Psychological Processes. Cambridge, MA: Harvard University Press; 1978.