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ASSISTIVE TECHNOLOGY AND ACADEMIC ACHIEVEMENT AMONG STUDENTS WITH LEARNING DISABILITIES

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ABSTRACT

Inclusive teaching strategies play an essential role in ensuring that students with diverse educational needs receive equitable, meaningful, and high-quality educational opportunities. Students may differ in their cognitive abilities, learning styles, language proficiency, cultural backgrounds, socioeconomic circumstances, physical abilities, emotional needs, and academic achievement levels. Therefore, a single teaching method may not effectively address the needs of every learner in a classroom. This study examines inclusive teaching strategies that can support participation, academic achievement, independence, and social interaction among diverse learners. It focuses on differentiated instruction, Universal Design for Learning (UDL), cooperative learning, scaffolded instruction, formative assessment, assistive technology, culturally responsive teaching, and collaboration among teachers, families, and educational specialists. The study adopts a qualitative literature-based research design using a thematic review of recent research and scholarly publications. The literature indicates that inclusive teaching is most effective when teachers provide flexible learning materials, multiple ways to access information, varied opportunities for demonstrating knowledge, clear classroom routines, and individualized support where necessary. Recent studies also emphasize that positive teacher–student relationships, accessible learning environments, professional development, and institutional support are important conditions for successful inclusion. However, limited resources, large class sizes, insufficient teacher preparation, and negative attitudes may restrict implementation. The study concludes that inclusive education should be understood as a continuous process of adapting teaching practices and learning environments to respond to student diversity. A coordinated approach involving teachers, school leaders, families, and support professionals can help create classrooms in which all students are respected, supported, and encouraged to achieve their potential.

***KEYWORDS**: Inclusive education, inclusive teaching strategies, diverse educational needs, differentiated instruction, Universal Design for Learning, cooperative learning, assistive technology, educational equity, student participation, academic achievement.*

INTRODUCTION

Education is a fundamental right that should be available to every learner, regardless of ability, disability, language, culture, gender, socioeconomic status, or individual learning requirements. Contemporary classrooms increasingly bring together students with a wide range of educational experiences and learning characteristics. Some students acquire new concepts quickly, while others require additional explanation, repetition, practical activities, visual support, or individualized guidance. Some learners experience disabilities or specific learning difficulties, while others face language barriers, emotional challenges, interrupted schooling, or limited access to educational resources. Bakhytzhamal, S., Dinara, Y., & Gao, C. (2026). found that These differences make it necessary for educational institutions to adopt teaching approaches that recognize learner diversity and provide meaningful opportunities for participation and achievement.Inclusive education extends beyond placing students with different needs in the same classroom. It requires teachers and institutions to identify and reduce barriers that prevent learners from accessing lessons, participating in classroom activities, developing relationships with peers, and demonstrating their knowledge. An inclusive classroom values individual differences and provides appropriate support without unnecessarily separating students from their classmates. This approach also challenges the assumption that all learners should learn in exactly the same way or demonstrate achievement

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through a single assessment method. Instead, it encourages flexibility in instructional materials, teaching processes, classroom organization, assessment, and student support.Differentiated instruction is one important strategy for responding to classroom diversity. It involves adapting content, learning processes, assessment tasks, and the classroom environment according to students' readiness, interests, and learning profiles. For example, a teacher may introduce a concept through a short explanation, a diagram, a demonstration, and a guided activity. Students may then demonstrate understanding through written responses, oral explanations, presentations, or practical work, provided that these methods assess the intended learning outcomes.

Such flexibility can increase access to learning while maintaining appropriate academic expectations.Another important approach is Universal Design for Learning (UDL), which encourages teachers to plan learning experiences that offer multiple means of engagement, representation, and action or expression. Rather than waiting until a student experiences difficulty, teachers anticipate potential barriers during lesson planning and provide accessible alternatives from the beginning. Digital resources, captions, audio materials, clear instructions, visual organizers, and flexible assessment options may benefit many students, including learners with disabilities and students who are learning in an additional language.Recent research supports the importance of inclusive and equitable instructional practices. Dell'Anna, S., Frizzarin, A., & Biagiotti, G. (2026). Explained that Miller et al. (2025) reviewed equitable and evidence-based teaching practices, emphasizing the relevance of structured, research-informed approaches to meeting diverse learner needs. Olsson and Hansson (2025/2026) explored how teachers create inclusive learning environments and highlighted relationships, differentiation, predictable structures, and varied teaching approaches. A 2026 systematic review by Bakhytzhamal, Dinara, and Gao also identifies differentiated instruction, scaffolding, cooperative learning, technology-based support, and collaboration as relevant components of inclusive education. These findings underline that successful inclusion depends on both classroom practice and the broader educational environment.

Despite increased awareness of inclusion, practical challenges remain. Teachers may have limited preparation in special education, insufficient teaching assistants, overcrowded classrooms, inadequate technology, or restricted access to accessible learning materials. In some settings, inclusive education is treated primarily as a policy requirement rather than a comprehensive change in teaching and school culture. As a result, students may share the same classroom without receiving the support needed to participate meaningfully. It is therefore important to examine which teaching strategies can address diverse educational needs and what conditions are necessary for their effective implementation.This study explores inclusive teaching strategies through a literature-based approach. It considers how flexible instruction, collaborative learning, accessible materials, supportive assessment, technology, culturally responsive teaching, and partnerships among educators and families can contribute to inclusive learning environments. The purpose is to develop a clear understanding of practical strategies that teachers can use to improve access, participation, and educational opportunities for diverse learners.

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RESEARCH OBJECTIVE

1. To examine inclusive teaching strategies that support the academic achievement, classroom participation, and equitable learning opportunities of students with diverse educational needs.

RESEARCH QUESTION

1. How do inclusive teaching strategies support the academic achievement, classroom participation, and equitable learning opportunities of students with diverse educational needs?

LITERATURE REVIEW

Inclusive teaching refers to the deliberate planning and delivery of instruction that enables learners with different abilities, backgrounds, experiences, and support requirements to participate meaningfully in education. It recognizes that students do not begin learning from identical positions and may need different forms of support to achieve shared educational goals. Inclusive teaching therefore emphasizes accessibility, participation, respect, flexibility, and the removal of unnecessary learning barriers.A central principle of inclusive teaching is equity rather than identical treatment. Equality means providing the same resources or opportunities to everyone, whereas equity recognizes that some students require additional or different support to access those opportunities. For example, providing every student with the same printed worksheet may appear equal, but a learner with a visual impairment may require an accessible digital document or enlarged text. Similarly, a student learning in a second language may benefit from vocabulary explanations and visual examples before completing the same academic task as classmates.Inclusive teaching also requires teachers to maintain high expectations while recognizing individual differences. Olsson, Å., & Hansson, S. (2026). Explains thatSupporting a student does not mean automatically reducing the intellectual value of the learning experience. Instead, the teacher identifies the essential learning outcome and considers appropriate ways to help the student achieve it. Students may receive additional practice, guided examples, accessible materials, extra processing time, or assistive tools according to their needs.Recent research on inclusive educational practices highlights the importance of combining instructional planning with supportive classroom relationships and organizational arrangements. Olsson and Hansson's research, published online in December 2025 and appearing in a 2026 journal volume, identifies relational, didactic, organizational, and classroom-framing dimensions of inclusive practice. The findings suggest that teachers need both effective instructional methods and a safe, predictable classroom environment.

Inclusive teaching is also a shared responsibility. Classroom teachers, special educators, teaching assistants, school administrators, families, and relevant specialists can contribute to identifying barriers and planning appropriate support. This collaboration is particularly important when students have complex educational requirements that cannot be addressed through one teaching strategy alone.Differentiated instruction is a teaching approach in which teachers adapt the content, learning process, expected product, or learning environment to accommodate differences among students. Rather than expecting all learners to follow an identical route, the teacher provides appropriate options while maintaining clear learning

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objectives. Differentiation can be based on readiness, interests, language proficiency, prior knowledge, accessibility requirements, or demonstrated learning needs.Differentiating content means varying how students access information. Olsson, Å., & Hansson, S. (2026 revealed that A lesson may include a short written explanation, a visual diagram, an audio recording, a demonstration, and additional reading. Differentiating process involves changing how students engage with the content, such as providing guided practice for some learners while offering independent extension tasks to others. Differentiating products means allowing suitable ways to demonstrate learning, including essays, presentations, oral explanations, diagrams, or practical demonstrations when these methods align with the learning objective. Differentiating the learning environment may involve adjusting seating, reducing unnecessary distractions, creating quiet work areas, or organizing flexible learning groups.The effectiveness of differentiation depends on careful planning and assessment. Teachers need information about students' current understanding, strengths, and difficulties before selecting suitable instructional options. Formative assessment, observation, questioning, and short learning tasks can help teachers determine whether students need additional explanation or a more challenging activity. Differentiation should not become permanent grouping in which students are assigned fixed ability labels. Instead, groups and supports should change as students make progress.A 2026 systematic review by Dell'Anna, Frizzarin, and Biagiotti examined practice-oriented research on differentiated instruction in primary and secondary education. The review identified 35 articles and found that differentiation was commonly implemented during classroom instruction, particularly through changes to content and learning processes. It also highlighted the need for more detailed descriptions of teaching practices so they can be evaluated and adapted across contexts. These findings indicate that differentiation is more than preparing easier work for selected students. It requires teachers to consider the relationship between learning objectives, the characteristics of their learners, and the instructional decisions used to support progress. When carefully implemented, differentiation can make lessons more responsive, although its success depends on teacher expertise, manageable workloads, and access to appropriate resources.

Universal Design for Learning is a framework for planning flexible learning experiences from the beginning. It aims to anticipate barriers that may prevent students from accessing information, participating in activities, or demonstrating what they know. While individualized accommodations remain important, UDL encourages teachers to design learning environments that offer accessible options to a broad range of learners.UDL is commonly organized around three principles: multiple means of engagement, multiple means of representation, and multiple means of action and expression.Multiple means of engagement concern how students are motivated and involved in learning. Teachers can use meaningful examples, student choice, collaborative tasks, achievable challenges, and clear progress goals. Connecting lessons to students' experiences and interests can make learning more relevant, while providing structured choices can increase independence.Multiple means of representation involve presenting information in different formats. A teacher explaining a scientific concept might combine spoken explanation, written keywords, diagrams, demonstrations, and a short video with captions. Students who struggle with dense text may benefit from a visual organizer, while students who need additional language support may benefit from vocabulary lists and examples.Multiple means of action and expression allow students to demonstrate their knowledge in appropriate ways. Depending on the learning objective, a student might produce a written response, record an oral explanation, prepare a presentation, or complete a practical demonstration. These alternatives should not remove

essential requirements. For example, if the learning outcome specifically assesses writing fluency, an oral answer alone may not measure the intended skill.UDL is particularly useful in classrooms where students have diverse learning profiles because it reduces dependence on one method of teaching.

It also encourages teachers to think about accessibility before students encounter difficulty. However, UDL is not a complete substitute for individualized educational plans, disability-related accommodations, or specialist support when these are required.Research on teachers' implementation of UDL in inclusive classrooms published in 2026 examines how flexible representation, engagement, and opportunities for action and expression can support classroom teaching. The review emphasizes teacher preparation and the need to move from general awareness of UDL toward practical implementation. Effective UDL implementation requires more than adding digital resources to a lesson. Teachers must identify the intended learning outcomes, anticipate likely barriers, provide meaningful alternatives, and check whether the available options actually improve access. Schools can support this process by providing accessible materials, collaborative planning time, and ongoing professional development.Cooperative learning involves organizing students into structured groups in which they work together toward a shared learning goal. It can help diverse learners participate in classroom activities, exchange ideas, develop communication skills, and learn from classmates. However, simply placing students in groups does not guarantee inclusion. Group activities need clear objectives, defined responsibilities, appropriate support, and opportunities for every student to contribute.Teachers can assign rotating roles such as discussion leader, note-taker, materials organizer, researcher, or presenter. These roles should be flexible so that students are not repeatedly assigned tasks based on assumptions about their abilities or disabilities. For example, a student with limited writing fluency might contribute through oral discussion or visual organization, while still having opportunities to develop writing skills when appropriate.Peer support can also involve paired reading, peer explanation, collaborative problem-solving, and structured discussion. Students often benefit from hearing concepts explained in different words or observing how a classmate approaches a task. At the same time, teachers must ensure that students with additional needs are not made dependent on peers or treated as passive recipients of help.

Each student should retain meaningful responsibility for learning. Miller, E. K., Franco-Jenkins, X., Duncan, J. T., Reynolds Reddi, A., & Ward, C. (2025). Elaborated onCooperative learning may also strengthen classroom belonging. When students work toward shared goals and recognize one another's contributions, differences can become a normal part of classroom life rather than a reason for exclusion. Such activities can support empathy, respect, and positive peer relationships. Nevertheless, teachers should monitor group dynamics to prevent exclusion, bullying, unequal participation, or excessive reliance on one student.

METHODOLOGY

This study uses a qualitative, literature-based methodology to examine inclusive teaching strategies for students with diverse educational needs. It draws on scholarly publications concerning differentiated instruction, Universal Design for Learning, cooperative learning, scaffolding, formative assessment, assistive technology, culturally responsive teaching, classroom climate, teacher training, and institutional support.The review focuses on

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publications from 2025 and 2026 to emphasize recent discussions and research. Relevant literature is identified through academic search results and scholarly journal publications. Priority is given to systematic reviews, empirical studies, and peer-reviewed articles that directly address inclusive education, classroom teaching practices, or educational support for diverse learners.The literature is examined in relation to the research question: how do inclusive teaching strategies support academic achievement, classroom participation, and equitable learning opportunities? The analysis considers the strategies described, the learner needs addressed, the reported benefits, and the implementation challenges discussed by the authors.Because this study is based on existing literature, it does not involve recruiting students or teachers, conducting classroom experiments, or collecting new survey or interview data. The findings represent a thematic synthesis of the reviewed scholarship rather than original statistical results from participants.A limitation is that the study does not claim to be an exhaustive systematic review with a fully documented database search, duplicate screening, formal risk-of-bias assessment, or quantitative meta-analysis. The conclusions should therefore be interpreted as a structured literature-based discussion, not as a definitive estimate of the effectiveness of every inclusive teaching strategy.

RESEARCH DESIGN

The study adopts a qualitative descriptive literature-review design. This design is appropriate because the objective is to describe, compare, and synthesize teaching approaches used to support learners with diverse educational needs rather than to test a new intervention.The literature is compared across these categories to identify shared recommendations, differences in emphasis, recurring implementation barriers, and areas requiring further research. The design enables the study to bring together instructional and organizational considerations that may otherwise be discussed separately.The review is not a primary experimental study. Consequently, no experimental and control groups, participant sample, intervention period, or statistical significance tests are claimed. Any statements about outcomes are attributed to the literature and should not be interpreted as results from newly collected data.

DATA ANALYSIS

The data analysis for the study titled “Assistive Technology and Academic Achievement Among Students with Learning Disabilities” focuses on examining how assistive technologies support students’ academic performance, learning participation, comprehension, reading, writing, and mathematical skills. In this study, a qualitative descriptive approach can be used to analyze information obtained from published research articles, academic journals, books, and relevant educational reports. The collected information is organized into major themes, including reading and writing support, mathematical learning, classroom participation, independent learning, motivation, and accessibility. Assistive technologies such as text-to-speech software, speech-to-text applications, audiobooks, screen readers, spelling and grammar tools, graphic organizers, and specialized educational software can help students overcome specific learning barriers and engage more effectively with academic tasks. For example, text-to-speech tools may help students with reading difficulties understand written material by converting text into spoken language, while speech-to-text applications may assist students who experience difficulties with spelling, handwriting, or written expression. Similarly, digital mathematics tools and visual learning applications may

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help students understand numerical concepts and complete mathematical activities more independently.The analysis also considers the relationship between assistive technology use and key indicators of academic achievement, including test performance, assignment completion, reading fluency, writing accuracy, comprehension, and overall classroom engagement. The reviewed evidence suggests that assistive technology may improve academic outcomes when the selected tools match students' individual learning needs and are integrated into appropriate teaching strategies.

FINDINGS

The literature-based analysis identifies several key findings regarding inclusive teaching strategies for students with diverse educational needs.First, flexibility is a central feature of inclusive instruction. Students differ in how they access information, engage with lessons, and demonstrate understanding. Differentiated instruction and UDL provide frameworks for responding to these differences through accessible materials, varied activities, and appropriate assessment options. Recent reviews emphasize the importance of adapting instruction to classroom needs rather than relying on a single teaching method. Second, structured support can improve access to learning activities. Scaffolding, explicit instruction, guided practice, and clear task instructions provide learners with pathways into complex academic work. These strategies can be adjusted as students develop their skills and independence. Effective implementation requires teachers to monitor progress and change the level of support when necessary.Third, participation involves both academic and social inclusion. Cooperative learning, peer interaction, respectful communication, and a positive classroom climate can help students take part in classroom life. Research on inclusive learning environments highlights the importance of relationships, predictable structures, differentiated teaching, and opportunities for students to participate. Fourth, assessment should guide instruction. Regular formative assessment can help teachers identify misunderstandings, recognize progress, and provide timely support. Accessible assessment arrangements may reduce barriers unrelated to the learning objective. However, assessment adaptations must remain appropriate to the skill being evaluated.Fifth, technology can provide useful additional access. Assistive technology and accessible digital resources can support reading, writing, communication, organization, and access to learning materials. Their usefulness depends on appropriate selection, training, accessibility, and integration into teaching Research reviews identify limited training, insufficient resources, and high student–teacher ratios as challenges for inclusive education. Seventh, inclusion requires attention to the whole learner. Academic needs cannot always be separated from language, cultural, social, emotional, and environmental factors. Culturally responsive instruction, family engagement, and respectful classroom relationships help teachers consider students' circumstances without reducing them to a disability label or assumed learning profile.Overall, the findings indicate that inclusive teaching is best understood as a coordinated approach rather than a single method.

CONCLUSION

Inclusive teaching strategies are important for creating educational environments in which students with diverse educational needs can participate, develop skills, and work toward meaningful academic goals. Differences in ability, disability, language, culture, prior knowledge, and learning experience require teachers to move beyond uniform instructional

methods and consider a range of ways to support learning.This study examined differentiated instruction, Universal Design for Learning, cooperative learning, scaffolded instruction, formative assessment, assistive technology, culturally responsive teaching, positive classroom relationships, and collaboration among educational stakeholders. The literature suggests that these strategies can help teachers address learning barriers, provide appropriate support, and create more accessible learning experiences. Their value depends on how carefully they are planned, implemented, and evaluated in the classroom.The study also highlights that inclusion cannot be achieved through classroom techniques alone. Teachers require professional development, appropriate resources, sufficient planning time, supportive school leadership, and opportunities to collaborate with families and specialists. Without these conditions, even well-intentioned inclusive practices may be difficult to sustain.Educational institutions should therefore develop a whole-school approach to inclusion. Teachers should identify learning barriers, use formative assessment, provide flexible learning options, and maintain high expectations while responding to individual requirements. School leaders should support staff training, accessibility, appropriate accommodations, and regular evaluation of student participation and progress.Future research should examine how combinations of inclusive teaching strategies work in different educational contexts, including under-resourced schools and multilingual classrooms. Studies involving students, teachers, and families could also provide more detailed information about implementation challenges and student experiences.

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