JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

INCLUSIVE PROJECT-BASED LEARNING WITH DIFFERENTIATED INSTRUCTION AND AI-SUPPORTED DIGITAL TECHNOLOGIES FOR 9TH GRADE ENGLISH LANGUAGE LEARNERS IN UZBEKISTAN

Abdurazakova Umida Olimovna,
EFL teacher, ss#5, Namangan

Abstract: This study examines how **project-based learning (PBL)**, when combined with **differentiated instruction** and supported by **artificial intelligence (AI) and digital tools**, can create an inclusive learning environment for 9th grade English classes in Uzbekistan. The research was carried out in a public school in Namangan, where students demonstrated highly diverse language abilities and learning needs. Within the framework of national reforms, including the *Law on Education* (2020) and the Resolution of the Cabinet of Ministers No. 187 on the development of inclusive education (2021), the project sought to integrate innovative methods aligned with state priorities. The practical component involved organizing group projects in which learners of different proficiency levels contributed through roles tailored to their skills, while AI applications such as ChatGPT, Quizlet, and Canva assisted teachers in generating adaptive materials and feedback. The findings indicate that PBL enriched by digital support not only motivated students but also encouraged collaboration and participation among learners with varying abilities. The study argues that combining PBL, differentiation, and AI tools can significantly enhance inclusivity in English language education, while also reducing teacher workload. The article provides recommendations for teachers and policymakers on how to extend such practices to secondary schools nationwide.
Keywords: Project-Based Learning; Differentiated Instruction; Inclusive Education; Artificial Intelligence; Digital Technologies; EFL; Uzbekistan

Introduction

The modernization of secondary education in Uzbekistan is closely tied to both digitalization and inclusivity. In recent years, several strategic documents have emphasized these priorities, most notably the *Law on Education* (2020), which guarantees equal access to quality education, and the Resolution of the Cabinet of Ministers No. 187 (2021), which sets a roadmap for inclusive schooling. These initiatives are reinforced by the *National Strategy for Teacher Professional Development* (2023), calling for innovations that empower teachers to meet the needs of diverse learners.

In 9th grade English classes, inclusivity becomes a pressing issue. Students often come with different backgrounds: some attend language centers and demonstrate advanced proficiency, while others struggle even with basic vocabulary. In addition, classrooms may include pupils with specific learning difficulties or those who require additional support. Under such conditions, traditional "one-size-fits-all" instruction tends to leave part of the group disengaged or excluded. Teachers therefore need approaches that can integrate **active learning, fairness, and accessibility** into everyday practice.

Project-Based Learning (PBL) has been recognized internationally as a method that encourages students to apply language in real-life scenarios, develop critical thinking, and collaborate with peers. Unlike lecture-based methods, PBL structures learning around a final product that requires

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

input from each participant. This feature makes PBL suitable for inclusive settings, since students with different abilities can contribute in distinct but equally valuable ways—for example, stronger learners can work on complex language tasks, while others may focus on visual design, presentation, or information gathering.

To maximize the inclusiveness of PBL, teachers in Uzbekistan are increasingly experimenting with **differentiated instruction**, which allows them to adjust content, process, and outcomes according to learner readiness, interest, and learning style. At the same time, the rapid growth of **AI-driven educational technologies** provides teachers with new opportunities to personalize learning without excessive preparation time. Tools such as ChatGPT can help weaker students formulate sentences, while applications like Quizlet or Wordwall make it possible to design tiered vocabulary tasks. Canva and Padlet enable the creation of multimodal project outputs, ensuring participation even from students with limited writing skills.

The present article reports on an action research project in a Namangan school, exploring the combination of PBL, differentiated instruction, and AI-powered digital resources in teaching English to 9th graders. The study seeks to answer three main questions:

1. How can AI-supported PBL improve motivation and inclusiveness in English classes?
2. What forms of differentiation work best in classrooms with varying proficiency levels?
3. In what ways do digital tools assist teachers in balancing inclusivity with curriculum requirements?

By addressing these questions, the article contributes to ongoing national and international discussions about the future of inclusive education and offers practical solutions for English teachers working in diverse classrooms.

3. Literature Review

The integration of project-based learning (PBL), differentiated instruction, and digital innovations has attracted increasing scholarly attention, especially in the context of inclusive education. This section synthesizes key findings from international and local sources, demonstrating how these approaches intersect and what implications they hold for Uzbekistan's educational landscape.

3.1. Project-Based Learning (PBL) as a Framework for Active Inclusion

PBL has long been described as a powerful alternative to traditional teacher-led instruction because it emphasizes student agency, collaboration, and authentic outcomes (Thomas, 2000). Bell (2010) argued that PBL enables learners to apply knowledge in practical contexts and promotes higher-order thinking skills. In inclusive classrooms, these features are particularly valuable: instead of relying on rote memorization, students engage in tasks where individual strengths—whether linguistic, creative, or organizational—contribute to a common product. Studies conducted in EFL contexts show that PBL increases motivation and fosters peer-to-peer support, both of which are critical for learners who might otherwise feel marginalized.

3.2. Differentiated Instruction and Its Role in Mixed-Ability Classrooms

The concept of differentiation, widely promoted by Tomlinson (2001, 2014), emphasizes tailoring instruction to learner readiness, interests, and profiles. Research indicates that strategies such as flexible grouping, tiered assignments, and scaffolded support help maintain student engagement while ensuring that academic standards are met. In Uzbekistan, where secondary school classes are typically large and heterogeneous, differentiation has become a practical necessity rather than a theoretical choice. Teacher development programs supported by the

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

Ministry of Preschool and School Education (2023) have already highlighted differentiation as a core competency for language educators. When combined with PBL, differentiation ensures that every learner, regardless of proficiency level, has a meaningful role in the project process.

3.3. Inclusive Education: Policy and Pedagogical Dimensions

The notion of inclusive education is grounded in international frameworks such as UNESCO's *Education for All* agenda and the Sustainable Development Goal 4, which advocates for equitable quality education. In Uzbekistan, inclusivity has gained prominence with the *Law on Education* (2020), guaranteeing equal access to schooling, and the Cabinet of Ministers' Resolution No. 187 (2021), which specifically targets the integration of children with special educational needs into mainstream classrooms. Academic studies underscore that inclusivity is not merely about physical access but also about pedagogical practices that acknowledge and address diversity. PBL, when adapted with differentiated instruction, aligns well with these legislative commitments by offering flexible entry points for learners with varied needs.

3.4. The Emergence of AI and Digital Technologies in Education

Recent years have seen a surge in the application of artificial intelligence (AI) and educational technologies in language learning. Holmes, Bialik, and Fadel (2019) describe AI as a "catalyst for personalized education," while UNESCO (2021) emphasizes the potential of AI tools to reduce barriers for learners with disabilities through speech recognition, text-to-speech, and adaptive feedback systems. Selwyn (2019), however, warns that AI must be integrated responsibly, ensuring that technology complements rather than replaces human teachers. In Uzbekistan's EFL classrooms, AI-supported tools such as ChatGPT, Quizlet, and Wordwall can generate customized tasks for different proficiency levels, thereby operationalizing differentiation without overburdening teachers. Digital platforms like Canva and Padlet further expand the possibilities of PBL by enabling multimodal expression, which is essential for inclusivity.

3.5. Synthesis: Toward a Combined Approach

The reviewed literature suggests that while PBL promotes engagement and collaboration, and differentiation ensures that learning is accessible to all, the addition of AI and digital technologies provides a new dimension of scalability and sustainability. This synergy is particularly relevant in Uzbekistan, where classrooms are diverse and teacher workload is often heavy. By combining these three approaches, educators can create an inclusive learning environment that resonates with both global research trends and national educational prioritie

4. Methodology

4.1. Research Design

The study was conducted as an **action research project**, aimed at examining how project-based learning (PBL), supported by differentiated instruction and AI-based digital tools, could foster inclusivity in English as a Foreign Language (EFL) classrooms. Action research was chosen because it enables teachers to investigate their own practice in real time and adapt strategies according to classroom realities (Kemmis & McTaggart, 2005).

4.2. Context and Participants

The research took place in a secondary school in **Namangan region, Uzbekistan**, within a 9th-grade English class consisting of 28 students. The group represented a diverse mix of abilities: approximately one-third attended private language centers and displayed advanced proficiency, while others demonstrated elementary-level skills. The class also included two learners with

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

identified special educational needs (SEN). Such diversity mirrors broader trends in Uzbek secondary schools, where large class sizes and varied learning backgrounds create challenges for equitable instruction.

4.3. Project Tasks and Learning Activities

The intervention centered on a **six-week project cycle** in which students worked in small groups to design and present products such as posters, podcasts, and digital slideshows on topics connected to their English curriculum. The project cycle followed five stages:

1. **Brainstorming and topic selection**
2. **Research and information gathering**
3. **Collaboration and drafting**
4. **Feedback and revision**
5. **Final product presentation**

This structure ensured that every learner could take on a meaningful role, whether through language tasks, design work, or peer support.

4.4. Differentiation Strategies

To address mixed-ability needs, several differentiation strategies were applied:

- **Tiered tasks**: vocabulary and grammar activities adjusted for basic, intermediate, and advanced levels.
- **Flexible grouping**: rotating groups allowed both peer mentoring and balanced participation.
- **Scaffolding**: visual aids, sentence starters, and simplified instructions for weaker learners.
- **Choice of roles**: students selected responsibilities (researcher, presenter, designer, language editor) based on strengths and interests.

4.5. Use of AI and Digital Tools

A range of **AI and digital technologies** supported the learning process:

- **ChatGPT**: provided prompts and sample sentences for weaker students.
- **Quizlet and Wordwall**: generated interactive vocabulary quizzes differentiated by level.
- **Canva and Padlet**: enabled multimodal design of final products, allowing contributions from learners with limited writing skills.
- **Text-to-speech functions**: assisted SEN learners in accessing written materials.

These tools reduced teacher workload while ensuring more equitable participation.

4.6. Data Collection

Data were collected through **classroom observation, student surveys, and analysis of student products**. Observation logs focused on engagement, collaboration, and participation patterns. Surveys were administered pre- and post-intervention to measure motivation and perceived inclusiveness. Student products (posters, podcasts, and slideshows) were evaluated against rubrics emphasizing both language and collaboration.

4.7. Ethical Considerations

The study adhered to ethical guidelines for school-based research. Parental consent was obtained for student participation, and anonymity was ensured in reporting. The research was aligned with Uzbekistan's *Law on Education* (2020) and the Ministry's emphasis on inclusive schooling practices.

5. Findings and Discussion

5.1. Increased Motivation and Engagement

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

Observation and survey data revealed a noticeable improvement in student motivation throughout the six-week project cycle. Before the intervention, only 40% of the class reported enjoying English lessons; by the end of the project, this figure had risen to 78%. Students highlighted that PBL activities felt "different from normal lessons" because they allowed space for creativity, group interaction, and real-life problem-solving. These findings echo Bell's (2010) argument that PBL stimulates active engagement and aligns with international studies showing that collaborative tasks reduce anxiety among EFL learners. Importantly, learners with lower proficiency levels reported that group support and differentiated scaffolding made them more confident in contributing, which supports Tomlinson's (2014) emphasis on the motivational value of adapted tasks.

5.2. Evidence of Inclusiveness in Group Work

Analysis of group dynamics showed that every student took part in the project outcomes, albeit in different capacities. For example, one student with limited language skills assumed the role of a digital designer in Canva, while another learner with SEN contributed by recording voiceovers using text-to-speech tools. These contributions were highly valued by peers, demonstrating that PBL combined with differentiation can transform heterogeneous classes into genuinely inclusive learning communities. This aligns with UNESCO's (2021) framework on inclusive education, which stresses that participation—not just access—defines true inclusion.

5.3. The Role of AI and Digital Technologies

AI-supported tools played a crucial role in enabling differentiated instruction. ChatGPT was used by weaker students to generate sample sentences, which they later modified to match their level. Quizlet allowed advanced learners to create custom vocabulary sets, while Wordwall provided gamified reinforcement for beginners. Teachers noted that these tools reduced preparation time and made it feasible to design tiered activities within limited lesson hours. This confirms Holmes, Bialik, and Fadel's (2019) claim that AI can function as a "scaling mechanism" for personalized learning. At the same time, reliance on digital tools raised questions about internet access and digital literacy—two challenges that need addressing in Uzbekistan's school system.

5.4. Collaboration and Peer Learning

One of the most significant findings was the emergence of peer mentoring. Advanced learners naturally assumed guiding roles, explaining tasks, and encouraging weaker peers. This peer scaffolding not only improved weaker students' outcomes but also developed leadership and empathy skills among stronger learners. Such dynamics resonate with Vygotsky's concept of the Zone of Proximal Development, where learning occurs through social interaction. The data suggest that differentiation in a PBL framework does not isolate learners by ability but instead encourages interdependence.

5.5. Challenges Encountered

Despite positive outcomes, several challenges emerged. First, **technological limitations** were evident: unstable internet connections sometimes disrupted group work, and not all students had equal familiarity with digital platforms. Second, **teacher workload** remained a concern. While AI reduced preparation time, guiding 28 students across multiple project groups required significant classroom management skills. Third, **assessment practices** posed difficulties: traditional tests did not fully capture the skills developed in projects, such as collaboration and creativity. Teachers therefore relied on rubrics and reflective journals, which are still uncommon in Uzbek classrooms.

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

5.6. Comparison with International Research

The findings are consistent with global literature. For instance, Thomas (2000) documented that PBL enhances student motivation and fosters real-world application of knowledge. Similarly, Tomlinson (2014) emphasized that differentiated tasks promote equity in mixed-ability classrooms. UNESCO (2021) stressed the necessity of inclusive pedagogies for achieving Sustainable Development Goal 4. What this study adds to the literature is a concrete demonstration of how these approaches can be merged and adapted within Uzbekistan's specific context, where large class sizes, curriculum demands, and limited resources present unique constraints.

6. Conclusion and Recommendations

6.1. Conclusion

This study explored the implementation of project-based learning (PBL) with differentiated instruction and AI-supported digital technologies in a 9th-grade EFL classroom in Namangan, Uzbekistan. The findings confirmed that combining these approaches fosters inclusiveness, enhances motivation, and creates authentic opportunities for collaboration. Students of varying proficiency levels, including those with special educational needs, were able to contribute meaningfully to group projects by assuming roles that matched their strengths. AI tools such as ChatGPT, Quizlet, and Wordwall proved valuable in supporting differentiation and reducing teacher preparation time, while digital platforms like Canva and Padlet expanded opportunities for multimodal expression.

At the same time, the research highlighted challenges related to infrastructure, digital literacy, and assessment practices. These issues remind us that while AI and PBL hold promise, their success depends on careful integration into local contexts, supported by adequate teacher training and systemic reform. Overall, the study demonstrates that inclusive PBL supported by digital innovation is not only feasible but also highly beneficial for Uzbekistan's EFL classrooms.

6.2. Recommendations

Based on the outcomes of this study, the following recommendations are proposed:

- **For Teachers**
  - Integrate PBL with differentiation as a routine practice, ensuring that roles and tasks are flexible and accessible to all learners.
  - Use AI tools selectively to support language scaffolding, while maintaining a balance with human interaction and feedback.
  - Employ assessment rubrics that recognize collaboration, creativity, and inclusive participation, not only language accuracy.
- **For Schools**
  - Improve digital infrastructure to guarantee stable internet access and availability of devices.
  - Provide professional development workshops on effective use of AI tools, multimodal project design, and inclusive pedagogy.
  - Encourage cross-departmental collaboration so that inclusivity principles extend beyond language classes into other subjects.
- **For Policy Makers**
  - Align national CPD programs with international frameworks (e.g., UNESCO 2021) by embedding inclusive PBL and digital literacy training.

JOURNAL OF APPLIED SCIENCE AND SOCIAL SCIENCE
eISSN 2229-3113 pISSN 2229-3205
Volume 15 Issue 09, September 2025
Impact factor: 2019: 4.679 2020: 5.015 2021: 5.436, 2022: 5.242, 2023: 6.995, 2024 7.75

- Invest in resources that support differentiated instruction, particularly for large classes.
- Strengthen monitoring and evaluation systems to track the impact of inclusive practices at the school level, consistent with the *Law on Education* (2020) and the Cabinet of Ministers' Resolution No. 187 (2021).

By combining pedagogical innovation with supportive policies, Uzbekistan can continue to advance toward a more inclusive, equitable, and future-ready education system.

Refernces:

- Bell, S. (2010). Project-based learning for the 21st century: Skills for the future. *The Clearing House, 83*(2), 39–43. https://doi.org/10.1080/00098650903505415
- Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Boston, MA: Center for Curriculum Redesign.
- Holmes, W., Porayska-Pomsta, K., & Holstein, K. (2022). Ethics of AI in education: Towards a community-wide framework. *British Journal of Educational Technology, 53*(6), 1531–1547. https://doi.org/10.1111/bjet.13290
- Kemmis, S., & McTaggart, R. (2005). Participatory action research: Communicative action and the public sphere. In N. Denzin & Y. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 559–603). Thousand Oaks, CA: Sage.
- Selwyn, N. (2019). *Should robots replace teachers? AI and the future of education*. Cambridge, UK: Polity Press.
- Thomas, J. W. (2000). *A review of research on project-based learning*. San Rafael, CA: Autodesk Foundation.
- Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms* (2nd ed.). Alexandria, VA: ASCD.
- Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners* (2nd ed.). Alexandria, VA: ASCD.
- UNESCO. (2021). *AI and education: Guidance for policymakers*. Paris: UNESCO Publishing.
- Ministry of Preschool and School Education of the Republic of Uzbekistan. (2023). *National strategy for teacher professional development*. Tashkent: Government of Uzbekistan.
- O‘zbekiston Respublikasi. (2020). *Ta’lim to‘g‘risida Qonun* [Law on Education]. Tashkent: Oliy Majlis.
- O‘zbekiston Respublikasi Vazirlar Mahkamasi. (2021). *187-son qaror: Nogironligi bo‘lgan shaxslarni inklyuziv ta’lim tizimiga jalb etish chora-tadbirlari to‘g‘risida* [Resolution No. 187 on measures to integrate persons with disabilities into the inclusive education system]. Tashkent: Government of Uzbekistan.