

# **The Effectiveness of Using Technology in English Language Classrooms among Secondary Level Students in Nukus, Uzbekistan**

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## **Abstract**

This study investigates the impact of technology integration on English language learning among secondary students in Nukus, Uzbekistan. Using a quasi-experimental one-group pre/post-test design, 40 Grade 9 students received instruction supplemented by digital tools such as Duolingo, YouTube, Kahoot, and Google Docs over an 8-week period. Results revealed a statistically significant improvement in English proficiency across reading, writing, speaking, and listening. Skill-specific analyses showed strongest gains in listening and vocabulary. The study also found increased student motivation and out-of-class language engagement. Limitations include the lack of a control group and short intervention duration. These findings underscore the need for further research, enhanced pedagogical training, and equity-focused implementation strategies to support technology-integrated language learning.

**Keywords:** *Computer-Assisted Language Learning, EFL Classrooms, Language Proficiency, Secondary Education, Technology Integration*

## **Introduction**

Sustainable In the 21st century, the integration of technology into educational settings has transformed from a progressive luxury to an essential foundation of language learning environments (OECD, 2001). Traditional instructional configurations that prioritize static textbooks and teacher-centred lecturing frequently struggle to meet the communicative demands required for global modernization. Within non-native environments, students face significant modern challenges acquiring English fluency due to limited exposure outside formal school contexts (Nunan, 2003). Computer-Assisted Language Learning (CALL) environments mitigate these gaps by transitioning passive language instruction into interactive, communicative frameworks (Warschauer & Healey, 1998).

The educational ecosystem of Uzbekistan is currently experiencing comprehensive systemic reforms aimed at digitalizing local schools and institutional frameworks (Tursunov, 2023). Despite strong national initiatives, secondary school English as a Foreign Language (EFL) pipelines face distinct regional constraints. Urban centres often enjoy better resource allocations, leaving regional municipal institutions in areas like Nukus encountering specific challenges including baseline digital infrastructure and access gaps (Saidova, 2022). While theoretical models suggest that introducing digital media elevates regional performance, empirical verification across regional secondary classrooms remains sparse.

By applying Self-Determination Theory, researchers state that digital systems cultivate intrinsic motivation by establishing higher feelings of competence, learner autonomy, and peer-to-peer engagement (Deci & Ryan, 1982). Furthermore, Sociocultural Theory posits that tech-mediated environments foster a digital Zone of Proximal Development via scaffolding tools like immediate corrective software algorithms and group interactions (Vygotsky, 1978). This research addresses regional gaps by providing concrete, local data on tech-enhanced language performance. The target objective of this study was to evaluate the absolute instructional effectiveness of specific digital tools on English language proficiency and student motivation profiles among Grade 9 students within a secondary school in Nukus, Uzbekistan.

## **Review of Related Literature**

The literature highlights the transformative role of digital technologies in English as a Foreign Language (EFL) learning, particularly in contexts with limited exposure outside classrooms. Early work on intrinsic motivation and self-determination (Deci & Ryan, 1982) established that learner autonomy and competence are critical for sustained engagement, while Sociocultural Theory (Vygotsky, 1978) emphasized scaffolding and peer interaction as essential for language development. Within this framework, Computer-Assisted Language Learning (CALL) emerged as a major innovation, shifting instruction from passive textbook-based learning to interactive, communicative environments (Warschauer & Healey, 1998).

In the Asia-Pacific region, the global spread of English has reshaped educational policies, requiring more communicative and technology-driven approaches (Nunan, 2003). The OECD (2001) report underscored the importance of ICT integration in schools, framing digital tools as essential rather than optional. In Uzbekistan, systemic reforms have prioritized digitalization, yet regional disparities remain. Urban schools benefit from stronger infrastructure, while municipal institutions in areas like Nukus face challenges in access and implementation (Tursunov, 2023; Saidova, 2022). Empirical studies show that digital media enhances student motivation in urban classrooms, but rural contexts require targeted strategies to overcome resource gaps.

Overall, the literature suggests that digital tools can significantly improve EFL performance by fostering motivation, autonomy, and communicative competence. However, successful implementation depends on addressing institutional inequalities and aligning technology use with pedagogical frameworks that emphasize both self-determination and sociocultural interaction. This balance is crucial for ensuring equitable and effective language learning outcomes in Uzbekistan and beyond.

## **Objectives**

This article are to evaluate the instructional effectiveness of specific digital tools on English language proficiency among Grade 9 students in Nukus, Uzbekistan. It seeks to examine how technology integration transforms traditional teacher-cantered instruction into interactive, communicative frameworks. The study aims to address regional constraints by analysing the impact of limited infrastructure and access gaps in municipal schools compared to urban centres. Another objective is to apply Self-Determination Theory to explore how digital systems foster intrinsic motivation through competence, autonomy, and peer engagement.

The research intends to use Sociocultural Theory to investigate how tech-mediated environments create a digital Zone of Proximal Development through scaffolding and group interaction. It aims to provide empirical data on the effectiveness of digital media in regional secondary classrooms, filling gaps in existing theoretical models. The study also seeks to analyse student motivation profiles in relation to digital learning tools and to assess the role of national reforms in shaping classroom practices. Ultimately, the objectives are to contribute to educational policy by offering context-specific insights into how digital transformation can enhance language learning outcomes, reduce disparities between urban and regional schools, and strengthen the overall effectiveness of EFL instruction in Uzbekistan.

## Methodology

This research employed a quantitative quasi-experimental design using a single-group pre-test and post-test architecture monitored over a continuous 8-week period. The experimental cohort consisted of 40 Grade 9 secondary school students (22 female, 18 male, average age 14.5 years) drawn via purposeful sample distribution from a public school located in Nukus, Karakalpakstan.

The instructional intervention directly incorporated a structured curriculum featuring specific digital media solutions selected to reinforce distinct linguistic proficiencies. Grammar and vocabulary tracking were managed via daily personalized assignments on the Duolingo platform. Listening comprehension modules were supplemented utilizing contextual educational videos via YouTube (10 minutes per session). Interactive assessment frameworks were administered through gamified, bi-weekly competitive check-ins using Kahoot. Collaborative writing practical were developed synchronously via shared digital workspaces using Google Docs. Linguistic benchmarks were assessed utilizing standardized diagnostic instruments covering listening, reading, writing, and speaking proficiencies before and after the intervention.

Linguistic score datasets were aggregated, converted into percentage scores, and analysed using IBM SPSS Statistics software. Due to the longitudinal tracking configuration of a single experimental sample, paired-samples t-tests were used to measure score variations before and after tech deployment. Statistical significance was verified relative to a threshold of  $p < 0.05$ .

## Findings and Discussion

Empirical metrics compiled at the conclusion of the 8-week instructional block showed clear performance changes across all diagnostic parameters. The cumulative mean score improved from a baseline pre-test value of 58.4% to a post-test value of 73.2%. To evaluate individual performance categories, comprehensive metrics are structured inside the summary table below.

*Table 1. Skills-Specific Pre-Test and Post-Test Language Proficiency Metrics*

| Language Skill Profile | Baseline Pre-Test Mean (%) | Post-Intervention Mean (%) | Net Score Change (%) | Paired t-test (t) | Significance (p) |
|------------------------|----------------------------|----------------------------|----------------------|-------------------|------------------|
| Listening Skills       | 52.3 ± 1.4                 | 71.8 ± 1.2                 | +19.5                | 6.42              | < 0.01           |

|                       |            |            |       |      |        |
|-----------------------|------------|------------|-------|------|--------|
| Vocabulary / Grammar  | 54.1 ± 1.1 | 72.4 ± 0.9 | +18.3 | 5.89 | < 0.01 |
| Reading Comprehension | 64.5 ± 1.6 | 76.2 ± 1.1 | +11.7 | 4.15 | < 0.05 |
| Writing Production    | 56.8 ± 1.3 | 67.5 ± 1.5 | +10.7 | 3.98 | < 0.05 |
| Verbal Speaking       | 64.3 ± 1.2 | 78.1 ± 1.0 | +13.8 | 4.81 | < 0.05 |

Source: Aggregated sample datasets collected over 8 weeks (n = 40)

The performance differences observed in Table 1 confirm that targeted tech integration yields variable results depending on the specific language domain. The highest net improvement was achieved in Listening Skills (+19.5%,  $t = 6.42$ ,  $p < 0.01$ ). This confirms that direct, repeated contact with authentic online audio materials lowers affective filters and enhances sound-to-script decoding capabilities.

Vocabulary and Grammar proficiencies also showed strong improvement (+18.3%), demonstrating the benefits of automated spaced-repetition loops and immediate platform feedback over mechanical worksheet drilling. Conversely, writing production metrics changed less drastically (+10.7%), showing that though digital peer editing via Google Docs optimizes structural planning, forming complex syntax requires continuous teacher scaffolding. Surveys administered after the intervention showed shifts in motivation. Students highlighted that the gamified mechanics of Kahoot and real-time score analytics boosted their intrinsic motivation to study outside school hours. This dynamic fits Self-Determination theory, as interactive digital elements empower self-directed learning and autonomy (Deci & Ryan, 1982).

## Conclusion

The implementation of educational technology within Grade 9 EFL classrooms in Nukus, Uzbekistan, led to a statistically significant improvement across all assessed core language competencies. The strongest experimental improvements occurred within listening and vocabulary channels, driven by daily exposure to multimedia scaffolding and gamified reinforcement systems. Furthermore, these digital workspaces improved active out-of-class engagement and autonomous collaboration.

While limited by its single-group configuration and short timeline, this study confirms that integrated CALL frameworks can improve educational delivery in regional Uzbek secondary schools. Future policy initiatives should focus on reducing regional digital equity gaps and providing teachers with systematic pedagogical training on tech integration.

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