

**DEVELOPING UNIVERSITY STUDENTS' DIGITAL COMPETENCE THROUGH
MOBILE-ASSISTED ENGLISH LANGUAGE LEARNING*****Yuldashev Sherzod Zairjanovich****Senior teacher, institute of pharmaceutical education and research****Taryanikova Marina Anatolievna****Senior teacher, institute of pharmaceutical education and research***Abstract**

The rapid digitalization of higher education has positioned digital competence as a core component of modern professional readiness. This study examines the pedagogical potential of mobile-assisted English language learning (MALL) tools—specifically Quizlet, Kahoot, and Duolingo—in fostering university students' digital competence. Using a mixed-method quasi-experimental design, the research investigates how systematic integration of mobile applications influences students' information literacy, communication, digital content creation, and problem-solving skills. Quantitative data were obtained through pre- and post-testing based on the DigComp 2.2 framework, while qualitative data were collected through interviews and classroom observations. The results demonstrate statistically significant improvements in all digital competence dimensions in the experimental group, confirming that mobile learning applications function not only as instructional tools but also as effective mechanisms for developing students' digital competence.

Keywords

digital competence, mobile learning, EFL, DigComp 2.2, Kahoot, Quizlet, Duolingo, higher education

Introduction

In the context of global digital transformation, higher education systems are increasingly required to prepare students who are not only linguistically competent but also digitally literate. The European DigComp 2.2 framework identifies digital competence as a fundamental lifelong learning skill, encompassing information literacy, communication, content creation, safety, and problem-solving abilities. However, empirical studies conducted in transitional education systems reveal that many university students demonstrate fragmented and insufficient digital competence levels.

English language education provides a particularly suitable platform for integrating digital tools due to its communicative and skills-based nature. Although digital platforms such as Quizlet, Kahoot, and Duolingo are widely used in language classrooms, their role in systematically forming students' digital competence remains insufficiently explored within Central Asian higher education contexts.

Research objective:

To empirically determine the effectiveness of mobile-assisted English language learning tools in developing university students' digital competence.

LITERATURE REVIEW

The conceptualization of digital competence as a multidimensional construct has gained increasing attention in international educational policy and empirical research. According to the European Commission's DigComp 2.2 framework, digital competence is defined as the confident, critical, and responsible use of digital technologies for learning, work, and participation in society. It comprises five core domains: information and data literacy, communication and collaboration, digital content creation, safety, and problem-solving. Within higher education, these domains are increasingly viewed as essential graduate attributes rather than supplementary skills.

Recent OECD (2023) reports emphasize that students in post-Soviet and developing education systems demonstrate a persistent digital skills gap, particularly in analytical information processing, content creation, and online collaboration. This gap poses a significant challenge to educational institutions attempting to modernize pedagogical practices. Consequently, universities are urged to integrate competence-based digital pedagogies into subject instruction rather than isolating digital literacy as a separate discipline.

Mobile-assisted language learning (MALL) has emerged as a particularly promising pedagogical approach for addressing this gap. Beatty (2013) and Kukulska-Hulme (2020) argue that language education provides a natural environment for digital integration due to its communicative orientation, emphasis on learner autonomy, and continuous formative assessment mechanisms. Mobile applications such as Quizlet, Kahoot, and Duolingo incorporate gamification, personalization, and adaptive feedback systems that actively engage learners in interactive digital environments.

Quizlet's flashcard-based learning environment enables students to create, adapt, and share content, thereby directly contributing to the digital content creation and information literacy components of DigComp. Kahoot's competitive quiz-based system strengthens communication, collaboration, and immediate data interpretation skills. Duolingo, as an AI-driven personalized platform, supports autonomous learning, progress tracking, and problem-solving through adaptive learning paths.

However, existing empirical research predominantly focuses on linguistic achievement outcomes, such as vocabulary acquisition and grammar improvement, while neglecting the broader competence-forming impact of these tools. Studies by Godwin-Jones (2011), Kessler (2018), and Al-Kathiri (2021) highlight the motivational benefits of mobile tools but rarely quantify their influence on digital competence domains. Furthermore, Central Asian higher education contexts remain underrepresented in MALL research, creating a critical empirical gap that this study addresses.

METHODOLOGY

Research Design

The study employed a quasi-experimental mixed-method design to examine the causal relationship between mobile-assisted English language learning and digital competence formation. The quantitative component utilized a pre-test–post-test control group design, while qualitative data were collected through semi-structured interviews and classroom observations to triangulate findings and enhance validity.

Participants

The sample consisted of 120 undergraduate EFL students enrolled in two higher education institutions in Uzbekistan. Participants were randomly assigned to experimental ($n = 60$) and control ($n = 60$) groups. Both groups were matched in terms of age, gender distribution, and baseline digital competence levels to ensure comparability.

Instruments

Digital competence was measured using a DigComp 2.2-based standardized Digital Competence Scale adapted to the Uzbek higher education context. The scale included 32 Likert-type items across four domains: information literacy, communication and collaboration, digital content creation, and problem-solving. The reliability coefficient (Cronbach's $\alpha = 0.91$) indicated high internal consistency.

Intervention Procedure

The experimental group participated in a 14-week mobile-integrated English course. Quizlet was used for vocabulary and grammar content creation tasks; Kahoot was employed for formative assessment and collaborative quizzes; and Duolingo was assigned for autonomous out-of-class practice. The control group received traditional instruction based on textbooks and paper-based exercises.

Data Analysis

Quantitative data were analyzed using SPSS 26. Descriptive statistics, paired-samples t-tests, ANOVA, and multiple regression analyses were conducted to examine group differences and predictive relationships.

STATISTICAL MODEL

The primary analytical model was a multiple linear regression model designed to determine the predictive contribution of each mobile application to digital competence development:

$$DC = \beta_0 + \beta_1 \text{ Kahoot} + \beta_2 \text{ Quizlet} + \beta_3 \text{ Duolingo} + \epsilon$$

In addition, confirmatory factor analysis (CFA) was conducted to validate the DigComp-based measurement model. Model fit indices demonstrated acceptable construct validity: $\chi^2/df = 2.14$, CFI = 0.96, RMSEA = 0.043.

RESULTS

Descriptive statistics revealed comparable pre-test digital competence levels between the experimental ($M = 53.1$) and control ($M = 52.8$) groups. Post-test results indicated a substantial increase in the experimental group ($M = 86.4$), while the control group exhibited only marginal improvement ($M = 61.7$).

Paired-samples t-tests confirmed that the observed differences were statistically significant ($p < 0.001$). Regression analysis demonstrated that Kahoot ($\beta = 0.42$), Quizlet ($\beta = 0.36$), and Duolingo ($\beta = 0.31$) were all significant predictors of digital competence development.

DISCUSSION

The findings substantiate mobile-assisted language learning as a transformative pedagogical approach rather than a supplementary technological addition. The significant predictive contribution of Kahoot underscores the importance of interactive assessment and collaborative learning in digital competence formation. Quizlet's contribution reflects the centrality of learner-generated content in developing information literacy and content creation skills. Duolingo's effect highlights the role of autonomous, self-regulated learning in problem-solving competence development.

These results align with DigComp 2.2 theoretical propositions and extend prior MALL research by empirically validating competence-based outcomes within a Central Asian higher education context.

CONCLUSION

This study provides robust empirical evidence that mobile-assisted English language learning constitutes a powerful pedagogical mechanism for the systematic formation of university students' digital competence. The quasi-experimental findings confirm that structured integration of mobile applications—specifically Quizlet, Kahoot, and Duolingo—produces statistically significant and educationally meaningful improvements across all core DigComp competence domains, including information literacy, communication and collaboration, digital content creation, and problem-solving skills.

Beyond enhancing linguistic performance, mobile technologies function as competence-forming environments that actively cultivate students' ability to navigate, evaluate, create, and manage digital information within authentic learning contexts. The regression and confirmatory factor analysis results validate the theoretical proposition that mobile-assisted pedagogies should be conceptualized not merely as supportive instructional tools, but as transformative educational systems that reconfigure the cognitive, social, and technological dimensions of learning.

The findings hold important implications for higher education policy and curriculum design. First, mobile-assisted language learning should be institutionalized as a strategic component of digital education reform rather than implemented as isolated methodological innovations. Second, teacher training programs must prioritize the development of pedagogical digital competence to ensure effective curricular integration of mobile technologies. Third, higher education

institutions should invest in technological infrastructure and policy frameworks that promote equitable access to mobile learning resources.

Finally, this study contributes to the global discourse on digital competence formation by providing empirical evidence from the Central Asian educational context, an area that remains underrepresented in international research. By demonstrating that English language instruction can serve as a catalyst for holistic digital competence development, the research establishes a scalable pedagogical model for preparing digitally competent graduates capable of meeting the demands of the 21st-century knowledge economy.

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