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¹L.N. Gumilyov Eurasian National University, Astana, Kazakhstan;

² West Kazakhstan Innovative Technological University, Uralsk, Kazakhstan.

E-mail: togzhan0591@mail.ru

USING AR EFFECTS IN SOCIAL NETWORKS TO ASSESS KNOWLEDGE ON INFORMATION AND COMMUNICATION TECHNOLOGIES

Abildinova Gulmira — Candidate of Pedagogical Sciences, associate professor, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan,

E-mail: abildinova_gm@enu.kz, ORCID: <https://orcid.org/0000-0001-9054-6549>;

Mukanova Togzhan — 2 year PhD's student, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan,

E-mail: togzhan0591@mail.ru, ORCID: <https://orcid.org/0009-0000-0958-9227>;

Kazhiakparova Zhadyra — candidate of pedagogical sciences, associate professor, West Kazakhstan Innovative Technological University, Uralsk, Kazakhstan,

Email: ghadira@rambler.ru, ORCID ID: <https://orcid.org/0000-0002-2347-911X>.

Abstract. Augmented reality (AR) is being actively introduced into digital learning environments, but its use in social media as a tool for pedagogical assessment remains poorly understood. Thus, the use of digital technologies and augmented reality technologies in the educational process is currently one of the most pressing issues. The purpose of this study is to empirically test the impact of augmented reality effects integrated into the TikTok platform on students' academic achievements in the information and communication technology course. The study was implemented in a quasi-experimental format with control ($n = 25$) and experimental ($n = 25$) groups. The main indicator of effectiveness was the increase in learning outcomes, measured on the basis of comparable pre-test and post-test assignments. To check the differences, the Student's t-test was used for independent samples. The results showed a statistically significant increase in the average score in the experimental group compared with the control group ($p < 0.05$), which indicates a positive effect of augmented reality assessment on the



assimilation of educational material. The data obtained confirm that augmented reality in a social network can act not only as a means of engagement, but also as a tool for formative assessment, providing a measurable educational effect. Furthermore, the findings highlight the potential of integrating augmented reality effects into familiar social media platforms to create interactive and accessible assessment experiences. The use of TikTok may increase students' motivation, encourage active participation, and provide immediate opportunities to demonstrate their understanding of ICT concepts. This approach also offers educators an alternative method of monitoring learning progress and identifying difficulties during instruction. However, the results should be interpreted considering the limited sample size and quasi-experimental design. Further research involving larger samples, longer intervention periods, and different educational contexts is needed to examine the sustainability of learning gains and the broader applicability of AR-based assessment strategies.

Keywords: augmented reality, TikTok, knowledge assessment, ICT, interactive tests, gamification, engagement

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© Абильдинова Г.М.¹, Муканова Т.Т.^{1*}, Кажиякпарова Ж.С.², 2026.

¹Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Астана, Қазақстан;

²Батыс Қазақстан инновациялық-технологиялық университеті,

Орал, Қазақстан.

E-mail: togzhan0591@mail.ru

AR-ЭФФЕКТИЛЕРДІ ӘЛЕУМЕТТІК ЖЕЛІЛЕР АРҚЫЛЫ АҚПАРАТТЫҚ-КОММУНИКАЦИЯЛЫҚ ТЕХНОЛОГИЯЛАР БОЙЫНША БІЛІМДІ БАҒАЛАУДА ҚОЛДАНУ

Абильдинова Гүлмира — п.ғ.к., қауымдастырылған профессор, Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Астана, Қазақстан,

E-mail: abildinova_gm@enu.kz, ORCID: <https://orcid.org/0000-0001-9054-6549>;

Муканова Тогжан — 2 курс докторанты, Л.Н. Гумилев атындағы Еуразия ұлттық университеті, Астана, Қазақстан,

E-mail: togzhan0591@mail.ru, ORCID: <https://orcid.org/0009-0000-0958-9227>;

Кажиакпарова Жадыра — п.ғ.к., қауымдастырылған профессор Батыс Қазақстан инновациялық-технологиялық университеті, Орал, Қазақстан,
E-mail: ghadira@rambler.ru. ORCID ID: <https://orcid.org/0000-0002-2347-911X>.

Аннотация. Толықтырылған шындық (AR) цифрлық оқыту орталарына белсенді түрде енгізілуде, алайда оны әлеуметтік желілерде педагогикалық бағалау құралы ретінде пайдалану жеткілікті деңгейде зерттелмеген. Сондықтан, білім беру үдерісінде цифрлық және AR технологияларын қолдану қазіргі таңда өзекті мәселелердің бірі болып отыр. Бұл зерттеудің мақсаты-TikTok әлеуметтік желісіне интеграцияланған толықтырылған шындық (AR) әсерлерінің студенттердің «Ақпараттық-коммуникациялық технологиялар» курсы бойынша оқу жетістіктеріне ықпалын анықтау. Зерттеу квазиэксперименттік әдіс арқылы бақылау ($n = 25$) және эксперименттік ($n = 25$) топтарының-қатысуымен жүргізілді. Тиімділіктің негізгі көрсеткіші ретінде pre-test және post-test тапсырмаларының салыстырмалы нәтижелері негізінде анықталған оқу жетістіктерінің өсімі алынды. Топтар арасындағы айырмашылықтарды анықтау үшін тәуелсіз үлгілерге арналған Стьюденттің t-критерийі қолданылды. Нәтижелер бақылау тобымен салыстырғанда эксперименттік топтағы орташа балдың статистикалық тұрғыдан маңызды өскенін көрсетті ($p < 0,05$), бұл AR арқылы бағалаудың оқу материалын меңгеруге оң әсер ететінін дәлелдеді. Алынған мәліметтер әлеуметтік желілердегі толықтырылған шындық (AR) технологиялары тек қызығушылықты арттыру құралы ғана емес, сонымен қатар өлшенетін білім беру нәтижелерін қамтамасыз ететін қалыптастырушы бағалау құралы бола алатындығын көрсетеді. Сонымен қатар, алынған нәтижелер интерактивті және қолжетімді бағалау тәжірибелерін қалыптастыру үшін кеңінен қолданылатын әлеуметтік желі платформаларына толықтырылған шындық әсерлерін енгізудің әлеуетін көрсетеді. TikTok платформасын пайдалану студенттердің оқу мотивациясын арттыруға, олардың белсенді қатысуын ынталандыруға және ақпараттық-коммуникациялық технологиялар (АКТ) тұжырымдамаларын түсіну деңгейін көрсетуге мүмкіндік береді. Бұл тәсіл оқытушыларға оқу барысындағы ілгерілеуді бақылаудың және оқу процесінде туындайтын қиындықтарды анықтаудың баламалы әдісін ұсынады. Алайда нәтижелерді зерттеуге қатысушылар санының шектеулілігін және квазиэксперименттік зерттеу дизайнын ескере отырып түсіндіру қажет. Оқу нәтижелерінің тұрақтылығын және толықтырылған шындыққа негізделген бағалау стратегияларын кеңінен қолдану мүмкіндіктерін анықтау үшін қатысушылар саны көбірек, зерттеу кезеңі ұзағырақ және әртүрлі білім беру контекстерін қамтитын қосымша зерттеулер жүргізу қажет.

Түйін сөздер: толықтырылған шындық, Tik-tok, білімді бағалау, АКТ, интерактивті тесттер, геймификация, қызығушылық

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¹Евразийский национальный университет имени Л.Н. Гумилева,
Астана, Казахстан;

²Западно-Казахстанский инновационно-технологический университет.
Уральск, Казахстан.

E-mail: togzhan0591@mail.ru

ПРИМЕНЕНИЕ AR-ЭФФЕКТОВ ПРИ ОЦЕНКЕ ЗНАНИЙ ПО ИНФОРМАЦИОННО-КОММУНИКАЦИОННЫМ ТЕХНОЛОГИЯМ ЧЕРЕЗ СОЦИАЛЬНЫЕ СЕТИ

Абильдинова Гульмира — кандидат педагогических наук, ассоциированный профессор, Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан,
E-mail: abildinova_gm@enu.kz, <https://orcid.org/0000-0001-9054-6549>;

Муканова Тогжан — докторант 2-го курса, Евразийский национальный университет имени Л.Н. Гумилева, Астана, Казахстан,
E-mail: togzhan0591@mail.ru, <https://orcid.org/0009-0000-0958-9227>;

Кажиякпарова Жадыра — кандидат педагогических наук, ассоциированный профессор, Западно-Казахстанский инновационно-технологический университет, Уральск, Казахстан,
E-mail: ghadira@rambler.ru, <https://orcid.org/0000-0002-2347-911X>.

Аннотация. Дополненная реальность (AR) активно внедряется в цифровые образовательные среды, однако её применение в социальных сетях в качестве инструмента педагогического оценивания остаётся недостаточно изученным. Таким образом, использование цифровых технологий и технологий дополненной реальности в образовательном процессе в настоящее время является одним из наиболее актуальных вопросов. Цель данного исследования — эмпирически проверить влияние AR-эффектов, интегрированных в платформу TikTok, на учебные достижения студентов по курсу информационно-коммуникационных технологий. Исследование реализовано в формате квазиэксперимента с контрольной ($n = 25$) и экспериментальной ($n = 25$) группами. Основным показателем эффективности выступал прирост учебных результатов, измеренный на основе сопоставимых заданий предварительного (pre-test) и итогового (post-test) тестирования. Для проверки различий применялся t-критерий Стьюдента для независимых выборок. Результаты показали статистически значимое повышение среднего балла в экспериментальной группе по сравнению с контрольной ($p < 0,05$), что свидетельствует о положительном влиянии AR-оценивания на усвоение учебного материала. Полученные данные подтверждают, что AR в социальной сети может выступать не только средством вовлечения, но и инструментом формирующего оценивания, обеспечивающим измеримый образовательный эффект. Кроме того, полученные результаты подчёркивают потенциал интеграции эффектов дополненной реальности в привычные платформы социальных сетей для создания интерактивных и доступных форм оценивания. Использование TikTok может повышать мотивацию

студентов, стимулировать их активное участие и предоставлять возможности для демонстрации понимания концепций ИКТ. Такой подход также предлагает преподавателям альтернативный метод отслеживания учебного прогресса и выявления трудностей в процессе обучения. Однако результаты следует интерпретировать с учётом ограниченного размера выборки и квазиэкспериментального дизайна исследования. Для оценки устойчивости достигнутых учебных результатов и более широких возможностей применения стратегий оценивания на основе дополненной реальности необходимы дальнейшие исследования с участием более многочисленных выборок, с более длительными периодами вмешательства и в различных образовательных контекстах.

Ключевые слова: дополненная реальность, TikTok, оценка знаний, ИКТ, интерактивные тесты, геймификация, вовлеченность

Introduction. Modern digital technologies are transforming educational processes. They offer innovative approaches to teaching and knowledge assessment. One of the key prospects of augmented reality (AR) is its ability to engage a broad audience and integrate educational content into social networks with a high level of user interest (Wu et al., 2013). In this context, TikTok is of particular interest. The platform is rapidly gaining popularity among young audiences. It also provides various opportunities for creating interactive educational AR effects (Ostrovski and Chen, 2020). The relevance of this study is determined by a significant research gap. AR solutions for entertainment content are developing rapidly. However, their pedagogical potential remains insufficiently explored. This is especially true in the field of assessing knowledge in information and communication technologies (ICT). Previous studies indicate that traditional testing methods often face several limitations. These include low student motivation and insufficient adaptability. Gamified formats in social networks may offer new approaches to competence assessment (Hamari and et al, 2016).

The theoretical foundation of this study is based on digital pedagogy (Jenkins, 2009), mobile learning (Sharples and et al., 2009) and research on the effectiveness of AR technologies in education (Martín-Gutiérrez and et al, 2015). However, the use of social media, particularly TikTok, as an assessment tool remains largely unexplored. This gap confirms the relevance of the present study. The purpose of this study is to assess the impact of AR effects on the TikTok platform as a means of evaluating students' knowledge in an ICT course. The research hypothesis is that the use of AR effects in social networks for monitoring students' ICT knowledge can improve assessment objectivity. It may also make the assessment process more comfortable and support its wider dissemination. The research question is as follows:

Does the use of AR effects in social networks as an assessment tool contribute to greater assessment objectivity?

The methodological basis of the study includes a quasi-experimental design. It

involves comparative tools, a formative stage of pedagogical testing, and statistical analysis of learning outcomes.

The practical significance of the study lies in the development of specific tools for integrating AR-based assessment into the educational process. It also includes recommendations for educators and developers of educational content. The findings may be applied in formal education, corporate training, and digital literacy programs. The study aims to verify the pedagogical effectiveness of AR-based assessment as a means of monitoring knowledge. According to the research hypothesis, the integration of AR tools into formative assessment leads to a statistically significant improvement in learning outcomes compared with traditional testing formats.

Augmented Reality as a Component of Digital Pedagogy

The development of information technologies is introducing significant changes into education and pedagogical practice. One of the most important outcomes is the emergence of hybrid learning. This model strategically combines traditional face-to-face instruction with digital educational platforms. Hybrid learning uses the advantages of both physical and virtual learning environments. It also supports the principles of individualized learning, increased student autonomy, and active participation. This blended approach preserves direct interaction and interpersonal communication in traditional classrooms. At the same time, it provides the flexibility, accessibility, and diversity of digital resources available through online platforms. (Means et al., 2020)

The adaptive and dynamic nature of hybrid learning helps address the diverse needs of students. It also supports the efficient use of educational resources. In addition, it encourages active participation through a variety of pedagogical methods. (Ofem et al., 2026)

Modern technological capabilities connect students, teachers, and educational institutions in multiple ways. They support administrative processes, registration systems, learning tools with feedback, intelligent tutoring systems, new assessment methods, simulation experiments, and other related innovations. (Scanlon, 2026) One technology that has received growing attention in educational research is augmented reality.

In recent years, interest in the use of augmented reality for creating unique educational environments has increased. However, research on its implementation in educational institutions remains limited. Existing studies do not fully address its advantages, limitations, effectiveness, challenges, and specific features. (Bacca et al., 2014)

Bacca-Acosta, Baldiris, Fabregat, Graf, and Kinshuk reported that the most frequently cited benefits of augmented reality in education are improved student achievement and increased motivation (Bacca et al., 2014). Similarly, Akshayur M. and Akshayur G. found that augmented reality contributes to higher academic performance in educational settings (Akçayır, and Akçayır, 2017).

Recent research has focused on the didactic aspects of AR use. These include the

design of educational environments, active learning methods, and the development of metacognitive skills. Nevertheless, several challenges remain. These include technical limitations, insufficient teacher training, and the lack of methodological recommendations for systematic implementation.

Thus, augmented reality should not be viewed as an independent educational tool. Rather, it is a component of digital pedagogy. Its effectiveness depends on pedagogical design, learning objectives, and the broader educational context. Future research should focus on developing sustainable models for AR integration. It should also assess long-term effects on educational outcomes and expand interdisciplinary research in this field.

Materials and methods. This study focused on the development, implementation, and evaluation of AR effects in the educational process. It also examined the extent to which this intervention improved learning outcomes compared with traditional forms of assessment.

A quasi-experimental research design was used. This design was appropriate because the random assignment of participants was limited by the organizational conditions of the educational process. It made it possible to evaluate the impact of the implemented assessment tool on learning outcomes. It also helped answer the research question of whether AR-based assessment leads to a statistically significant improvement in academic performance.

To determine the pedagogical effect of the intervention, Cohen's d was calculated. In addition, the magnitude of improvement in learning outcomes between the groups was analyzed. This made it possible to interpret the observed differences not only as statistically significant but also as educationally meaningful.

The study involved 50 undergraduate students enrolled in the course Information and Communication Technologies. The participants were divided into two groups of 25 students each. The control group completed assessments using traditional tools, such as LMS-based tests and standard electronic control tasks. The experimental group completed the same traditional assessments. In addition, they used AR effects on the TikTok social network.

Several conditions were controlled to ensure comparability between the groups. Both groups studied the same subject matter. They had a similar initial level of preparation, as determined by the pre-test results. They also completed a training module of the same duration and studied a comparable volume of instructional material.

As an additional intervention, AR-based assessment was implemented through TikTok AR effects, specifically interactive masks. The effects were created in Effect House. This platform enables the development of interactive AR scenarios with recognition, control, and visualization elements. It also supports the integration of gamification mechanics, such as visual prompts, feedback, and transition dynamics.

The AR tasks were designed around the topics of the ICT course. They were presented in several formats: single-choice and multiple-choice questions, true/

false tasks, matching exercises, and rating-scale activities. The primary didactic function of the AR effects in the experimental group was formative assessment. Students received interactive tasks and immediate feedback in a familiar digital environment. This reduced the formality of assessment and increased engagement with the evaluation process.

The study consisted of two stages. During the initial stage, both groups completed an entrance test. The purpose of this test was to diagnose their initial level of ICT knowledge. The test included tasks covering the main topics of the course. The pre-test results were used to verify the comparability of the groups. They also served as a baseline for measuring progress.

The formative stage was conducted differently in the two groups. In the control group, assessment was carried out in a traditional format. This included LMS-based tests, electronic assessments, and control tasks without an AR component. These activities covered the same topics and had a comparable level of difficulty. In the experimental group, students completed additional assessment tasks through TikTok AR effects.

The implementation of the AR tasks included interactive engagement, visual support, and game-based mechanics. Indicators of task completion and participation were also recorded. The formative period lasted four weeks. The amount of instructional material was the same in both groups. At the end of the module, both groups completed a final test. This test was comparable to the entrance test in structure and difficulty.

The main outcome measure of the study was the dynamics of learning achievement. Particular attention was paid to the difference in relative growth between the experimental and control groups. Learning achievement was measured through pedagogical test scores obtained from the entrance and final tests. The final indicators included individual growth and average group growth.

For the experimental group, behavioral indicators of interaction with the TikTok AR content were also recorded. The integrated analytics included the number of engagements, views, and interactions. The average duration of interaction was also measured. Data collection was therefore comprehensive. It combined pedagogical testing with TikTok platform analytics.

To examine the research question, both descriptive and inferential statistical methods were applied. The mean and standard deviation were calculated for the entrance and final test results in each group. Statistical analysis was also used to determine individual and group progress. Differences in mean scores and growth rates between the groups were compared using Student's t-test.

The study was conducted in accordance with ethical standards. These included obtaining informed consent from participants, ensuring confidentiality and anonymity, and guaranteeing the right to withdraw from the study at any stage. Special methodological attention was also given to the accuracy of test tasks, the accessibility of the interface, and the motivational quality of the educational content.

Development of AR effects for assessing knowledge in ICT

As part of this study, AR effects in various formats were developed for the TikTok social network. At the initial stage, a course was selected. Assessment materials and a corresponding scenario were then designed for this course.

The course Information and Communication Technologies was chosen because it is a compulsory component of all undergraduate educational programs. This made it possible to broaden the scope of the experimental work. The choice was also based on the intended learning outcomes of the course. These outcomes require students to participate actively in professional, social, and linguistic communication. They also emphasize the use of modern educational technologies, including ICT.

In addition, AR technology supports feedback through the visualization of objects. Therefore, a universal and visually clear thematic section was selected.

The assessment materials were developed in several formats. These included multiple-choice quizzes, true-or-false tasks, rating activities, and matching questions. The materials incorporated visual elements and sound effects. Their multimedia features also expanded the three-dimensional interactive space.

The use of gamification elements in AR effects made the assessment materials more engaging. It also encouraged active student participation and introduced elements of game-based competition. This, in turn, reduced stress and made the assessment process less formal. At the same time, it supported the functions of formative assessment (Figure 1).

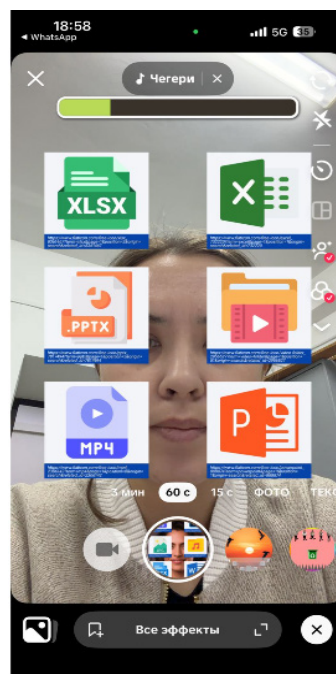
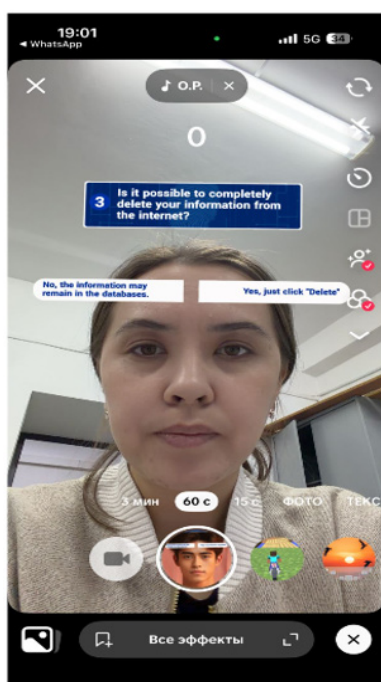




Figure 1 — Examples of AR effects created and used at Effect House

The development environment for the TikTok social network is Effect House. This platform supports a wide range of tools for overlaying AR objects. These tools are based on algorithms for face, hand, body, and object recognition and tracking. They also enable segmentation and real-time dynamic processing through machine learning. In addition, the platform allows developers to import and animate 3D objects. Physical properties, sound, and multimedia effects can also be added. These functions make AR masks more stable and realistic.

The integration of augmented reality into social networks has expanded its use as a tool for user engagement. It has also increased its popularity in the entertainment field. This is largely due to its ability to place virtual interactive elements within a physical environment.

Introduction and Popularization of AR Technologies for Assessing ICT Competencies on TikTok

Special attention was given to the integration of educational content into a digital environment that is popular among the target audience. This approach made the testing process more natural. It also increased the level of user engagement.

In addition, the preparation of AR content for knowledge assessment on TikTok required an integrated approach. Technical solutions alone were not sufficient. It was also necessary to ensure the effective introduction and popularization of AR content among the target audience. This process was carried out in accordance

with current trends in digital pedagogy (Jenkins et al., 2016). It also followed the principles of effective educational content distribution on social networks.

To expand the user audience and encourage participation, a promotion strategy was developed. This strategy was based on the organic content distribution mechanisms characteristic of TikTok. Particular attention was paid to embedding educational AR effects into natural patterns of user behavior. This made it possible to maintain a balance between entertainment and educational components (Zhao et al., 2021).

The analysis of implementation results showed that the combination of interactive AR elements with TikTok's viral distribution mechanisms increased user participation in knowledge assessment (Smith et al., 2022). Researchers also noted that the effective use of gamification principles was a key factor in the project's success. These principles were adapted to the specific features of the platform and the characteristics of the target audience (Deterding et al., 2011).

The findings are consistent with previous studies (Siemens, 2014). They confirm the potential of AR technologies in social networks for educational purposes. However, the implementation experience also showed that the effectiveness of this approach depends heavily on the characteristics of a specific platform. It is also influenced by the behavioral patterns of its users (Livingstone, 2018).

The effectiveness of the developed AR modules was evaluated through a comprehensive analytical approach. The analysis focused primarily on user engagement and learning outcomes. Data were collected using both TikTok's built-in analytics tools and additional tracking systems.

The analysis revealed considerable variation in engagement levels. These differences depended on the type of content and the time of publication. The highest level of activity was observed in interactive formats that included gamification elements. Learning effectiveness was assessed by examining user progress and changes in performance during repeated completion of test tasks.

The results demonstrate the potential of AR technologies in social media for knowledge assessment. At the same time, the study found that effectiveness depends significantly on the timing of publication and the format of content delivery. These factors should be examined further when developing similar educational solutions.

Results and Discussion. During the identification phase, an analysis of the results of the entrance testing was conducted to determine the initial level of preparation of students and to check the comparability of the control and experimental groups.

The average values were calculated according to the formula:

$$\bar{X} = \frac{\sum X_i}{n} \quad (1)$$

where is $\bar{X}$ - the average score of the group, X_i - is the individual result of the student, n - is the number of groups.

The average score in the control group was 63.2 (SD = 2.1), in the experimental group it was 64.1 (SD = 2.3). The differences obtained were not statistically significant ($p > 0.05$), which allows the groups to be compared correctly for initial and subsequent analysis. Change in academic achievement according to the results of pedagogical intervention. After the end of the formative period, a final test was conducted, which allowed assessing the dynamics of mastering the educational material (Table 1).

Table 1 — Dynamics of academic achievement of students in the control and experimental groups

Study group	Average score (Post-test)	SD
Control	68,1	2,4
Experimental	72,8	2,6

Thus, the increase in learning achievement observed in the experimental group was higher than that of the control group. This indicates that the use of AR technology not only increases interest in the learning process, but also provides an additional pedagogical effect as a formative assessment tool.

Assessment of the increase in learning outcomes

To quantitatively assess the effectiveness, the growth indicator was used:

$$\Delta = \bar{X}_{post} - \bar{X}_{pre}$$

Table 2 — Growth in students' academic achievement when using AR-assessment

Study group	Growth (Δ)
Control	+4,9
Experimental	+8,7

Thus, the increase in the experimental group was significantly higher, indicating an additional pedagogical effect associated with the use of AR assessment.

Student's t-test for independent samples was used to test the research hypothesis:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{SD_1^2}{n_1} + \frac{SD_2^2}{n_2}}} \quad (2)$$

The empirical value of the criterion is: $t_{emp} = 2,37$

Critical value at the level of importance $p = 0,05$ and $df = 48$:

$$t_{crit} = 2,01$$

$t_{emp} > t_{crit}$, the differences between the groups are statistically significant ($p < 0.05$), which confirms the influence of the experimental factor on learning outcomes.

The results of the study showed that AR-based assessment led to a significant improvement in learning outcomes compared with traditional forms of assessment. Therefore, the experimental factor, namely the AR intervention, can be considered an important predictor of improved academic performance.

Engagement indicators were treated as supporting characteristics of the digital environment. They helped explain the mechanisms underlying improved learning outcomes. However, they were not used as an independent measure of pedagogical effectiveness. The behavioral data on interaction with AR content on TikTok showed a substantial audience reach of more than 3,991 unique users. The number of content impressions exceeded 10,000. This indicates a high frequency of interaction with the materials. In addition, more than 3,000 targeted actions were recorded. This reflects a sufficient level of audience engagement.

The average duration of interaction with the educational modules was 12 seconds. For a short-video format, this can be considered an indicator of sustained user attention. Geographic analysis also showed that the content reached both Kazakhstani users and an international audience.

The indicators of interaction with AR content were used only as contextual data. They helped explain the mechanisms of student engagement in the assessment process. They were not considered an independent criterion of educational effectiveness. The primary measure of effectiveness remained the dynamics of learning outcomes.

The main finding of the study is that the statistically significant increase in academic achievement in the experimental group supports the use of AR-based assessment as an effective pedagogical tool. It can increase student interest and improve the quality of instruction. The results demonstrate that AR integration in the assessment process has a positive effect on academic achievement. Unlike many studies that examine AR mainly as a motivational tool, this study demonstrates its measurable impact on cognitive learning outcomes through statistical analysis.

The observed increase suggests that an interactive environment supports deeper and more stable mastery of educational content. This effect is achieved through the active involvement of students in the process of knowledge assessment (Alhazzaa and Yan, 2025).

It is important to note that improvement was observed in both groups. This reflects the natural process of knowledge acquisition during instruction. However, the significantly greater increase in the experimental group indicates an additional didactic effect associated with AR technologies. The interactive nature of the tasks, the visualization of learning content, and the use of gamification elements all contributed to higher cognitive activity. They also supported the formation of more stable cognitive connections during learning.

These conclusions are consistent with current research in digital pedagogy. Such research emphasizes that the effectiveness of educational technologies depends not on their technical features alone, but on the pedagogical design of their application. In this study, AR functioned not merely as a demonstration tool.

Instead, it served as a means of organizing assessment activities within a familiar digital environment. Embedding assessment into everyday digital practices reduced the formal perception of knowledge control. It also encouraged more natural student participation in the educational process.

Additional data from digital analytics showed a high level of user interaction with AR content. This suggests that participation may act as a potential mediator of improved learning outcomes. Thus, the educational effect was achieved not only through the presentation of information. It also resulted from a change in the learner's interaction with the assessment task. Students moved from passive test completion to active participation in an interactive educational situation.

At the same time, the findings should not be interpreted as evidence of the universal superiority of AR technology outside a specific pedagogical context. Its effectiveness depends directly on the methodological quality of the tasks, their alignment with educational objectives, and their degree of integration into the course structure. This confirms that augmented reality should be considered a component of a broader digital pedagogical ecosystem rather than an independent technological solution.

The limitations of the study are related to the relatively small sample size and the short duration of the pedagogical intervention. These factors do not allow for a comprehensive assessment of the long-term effects of AR-based assessment on educational outcomes. Future research may focus on expanding the sample, examining the stability of the observed effects over time, and exploring the integration of AR tools into different disciplinary areas.

Overall, the study shows that the introduction of augmented reality technologies into formative assessment practices can be considered an effective direction for modernizing knowledge assessment methods in the context of the digitalization of higher education.

The findings are consistent with current trends in digital pedagogy. They also highlight the importance of considering the behavioral characteristics of the digital generation (Al-Ansi et al., 2023). The study confirmed that integrating educational content into a familiar digital environment can increase engagement and improve learning outcomes. However, the identified usability issues indicate the need for further optimization of the user experience when developing similar AR-based solutions.

Conclusion. This study confirmed the pedagogical effectiveness of AR-based assessment. This was reflected in a statistically significant increase in students' academic achievement. The results show that the integration of AR tools into formative assessment supports deeper assimilation of educational material. It also improves final performance in the ICT course.

Thus, AR in social networks should not be regarded merely as an entertainment feature. Instead, it functions as a didactic tool that produces a measurable educational effect.

The study also demonstrated that AR effects in social networks can serve as an

effective formative assessment tool. The experiment showed that the introduction of AR-based tasks leads to a statistically significant improvement in academic achievement compared with traditional formats of knowledge assessment.

Therefore, the educational value of AR technology is determined not simply by the level of users' digital participation. Rather, it lies in its ability to transform assessment into an interactive cognitive activity. This transformation contributes to a deeper understanding of the learning material.

AR technologies on social platforms may be considered a new class of pedagogical assessment tools. These tools are integrated into the familiar digital environment of learners. Future research should examine the long-term impact of AR technologies on educational outcomes. It should also focus on developing comprehensive methodologies for their integration into contemporary educational practice. Particular attention should be given to improving user interfaces and adapting content for students of different ages and professional backgrounds.

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