SIRD Società Italiana di Ricerca Didattica
Giornale Italiano della Ricerca Educativa
Italian Journal of Educational Research

"Kahoot": theoretical analysis and application in armenian state institute of physical culture and sport (new data)

"Kahoot": analisi teorica e applicazione nell'istituto statale armeno di cultura fisica e sport (nuovi dati)

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OPEN ACCESS

Double blind peer review

Citation: Chatinyan, A., Abrahamyan, L. (2025). "Kahoot": theoretical analysis and application in armenian state institute of physical culture and sport (new data). *Italian Journal of Educational Research*, 34, 73-85
https://doi.org/10.7346/sird-012025-p73

Received: January 30, 2025
Accepted: May 7, 2024
Published: June 30, 2025

Pensa MultiMedia / ISSN 2038-9744
https://doi10.7346/sird-012025-p73

Abstract
The research examined the methodological features of using the "Kahoot" online platform in the teaching process of certain courses at the Armenian State Institute of Physical Culture and Sport (ASIPCS). Specifically, the most appropriate option for applying the platform, the time period allocated for the responses, the methodology for assessing knowledge, and other important issues have been clarified.
The study involved 80 second-year and 94 third-year students from both full-time and part-time education systems, as well as 80 master's students. A total of 23 Kahoot quizzes with 351 questions were created for the students, and 5 Kahoot quizzes with 76 tasks were created for the master's students.
The results of the study revealed that 97.2% of the respondents considered lessons conducted through "Kahoot" to be interesting and effective in improving the acquired knowledge (100% of responses). The effectiveness of the platform was rated between 4 and 5 points, whereas the effectiveness of traditional methods of knowledge assessment was rated between 2 and 5 points by the Master's Degree students.
The positive aspects of the platform highlighted by the respondents include the competitive atmosphere it creates and the opportunities for knowledge testing, correction, and improvement. Among the drawbacks of using "Kahoot," respondents mentioned unstable internet connection and the possibility of accidentally or randomly choosing the correct answer.

Keywords: "Kahoot", Student-athletes, Knowledge reinforcement, Testing.

Riassunto
La ricerca ha esaminato le caratteristiche metodologiche dell'utilizzo della piattaforma online "Kahoot" nel processo di insegnamento di alcuni corsi presso l'Istituto Statale Armeno di Cultura Fisica e Sport (ASIPCS).
In particolare, sono stati chiariti l'opzione più appropriata per l'applicazione della piattaforma, il tempo assegnato per le risposte, la metodologia di valutazione delle conoscenze e altre questioni importanti.
Allo studio hanno partecipato 80 studenti del secondo anno e 94 studenti del terzo anno dei programmi a tempo pieno e parziale, nonché 80 studenti del corso di laurea magistrale. Per gli studenti sono stati creati 23 quiz Kahoot con un totale di 351 domande e per gli studenti magistrali 5 quiz Kahoot con 76 compiti.
I risultati dello studio hanno rivelato che il 97,2% dei partecipanti ha considerato le lezioni condotte tramite "Kahoot" interessanti ed efficaci per migliorare le conoscenze acquisite (100% delle risposte). L'efficacia della piattaforma è stata valutata tra 4 e 5 punti, mentre l'efficacia dei metodi tradizionali di valutazione delle conoscenze è stata valutata tra 2 e 5 punti dagli studenti magistrali.
Tra gli aspetti positivi della piattaforma evidenziati dai partecipanti figurano l'atmosfera competitiva che essa crea e le opportunità di verifica, correzione e miglioramento delle conoscenze. Tra gli svantaggi dell'uso di "Kahoot", i partecipanti hanno indicato la connessione internet instabile e la possibilità di selezionare accidentalmente o casualmente la risposta corretta.

Parole chiave: "Kahoot", Studenti-atleti, Consolidamento delle conoscenze, Verifica

Credit author statement
Ashot Chatinyan: Conceptualization, methodology, data collection, initial draft preparation. Lianna Abrahamyan: Literature review, data analysis, results interpretation, writing—review and editing. Both authors approved the final manuscript. We would like to thank all students ASIPCS who took part in the study.

1. Introduction

Reforms in the education sector across many countries, including Armenia, aim at implementing profound and long-term changes to improve the outcomes of both general and higher education. Numerous issues have emerged in the educational processes of many national universities. One of the solutions lies in the broad application of modern approaches in education. These approaches aim to enhance the acquisition, reinforcement, and personalization of essential knowledge during the educational process, as well as to incorporate modern digital technologies for assessing students' knowledge.

It should be noted that there are quite few studies related to the use of the online platform "Kahoot" in the education sector in Armenia. The literature presents the results of H. Abrahamyan's research (2023), which was carried out at Yerevan Medical University, as well as V. Hovhannisyan's research (2022) carried out with the 11th grade students of high school (Abrahamyan, 2023; Hovhannisyan, 2022). Some studies are theoretical and analytical in nature, emphasizing the tool's significance in the educational system (Invincible Kahoot, 2024; Aghbalyan, 2021; Galstyan, 2023).

However, similar research has not been conducted in physical education and sports universities, particularly at the Armenian State Institute of Physical Culture and Sport (ASIPCS). An exception is the experimental research by A. Chatinyan and L. Abrahamyan (2024), which, however, did not include students in part-time learning systems, nor did it deeply explore learners' opinions on various aspects of using the «Kahoot» platform. This study was primarily of a pilot nature.

At ASIPCS, the educational process for student-athletes - some of whom are members of Armenia's national and club teams - includes a sports training component connected with daily practices, training camps, and competitions.

This leads to the possibility that they cannot always participate directly in the learning process at the university. In such cases, with the help of the Kahoot platform, they have the opportunity to engage in knowledge testing, assessment, and reinforcement. To acquire the necessary knowledge, they can use the materials posted on the Classroom platform.

As a result of the study, it was possible to clarify the most effective ways of using Kahoot, the time allocated for responses in both full-time and part-time education systems, the approaches to knowledge reinforcement, and the methodology for knowledge assessment.

Research purpose: To explore the methodological features of using the «Kahoot» online platform in the teaching process of some academic subjects at ASIPCS.

2. Research methods and organization

The research used the method of studying and analyzing scientific-methodological literature, the experimental use of «Kahoot» in the educational process, an oral survey and an online survey using the «Google Forms», mathematical statistics.

The first phase of the research was carried out during the 2023-2024 academic year in the full-time bachelor and master degree programs at ASIPCS, involving 70 second-year and 66 third-year students, aged 19-21 , and 35 master's students aged 24-45 (the average age: 26).

At ASPC, the duration of studies in the full-time master's program is one year. Approximately 92% of participants were male. In the «Department of Sports Pedagogy and Psychology,»23 Kahoot quizzes, containing 351 questions (tests) were created to assess and improve students' theoretical knowledge teaching «General Pedagogy» and «Sports Pedagogy.» For the master's degree program, 5 Kahoot quizzes with 76 tasks were used for teaching "Higher Education Pedagogy.» This platform was also used at the «Chair of Sports Management and Journalism" for the course of «Economics,» using 5 Kahoot quizzes with 56 tasks.Within the framework of the presented academic subjects, this electronic platform was applied and studied at ASIPCS for the first time by the authors.

The second phase of the research was carried out during the 2024-2025 academic year within the same courses, involving full-time and part-time 10 2nd year and 28 3rd year Bachelor's degree students, as well as 45 Master's degree students. The average age of part-time learning participants was 27 and 35, respectively.

3. Analysis of literary sources on «Kahoot» and similar platforms

Today, the educational process is impossible to imagine without the use of modern information technologies, which allow to increase the motivation and efficiency in education, improve student's level of knowledge, improve teaching methods, contribute to the operational and objective assessment of knowledge and, thus, open up new opportunities in the field of education.

In the educational system, including higher education, gamification approaches and developed technologies have begun to be used for teaching and assessing knowledge and skills. These involve the application of techniques characteristic of computer games in non-gaming processes, offering significant prospects and opportunities.

By involving students in learning process, gamification promotes their personal development and helps them uncover their potential, even in areas previously unknown to them (10 Best Free Kahoot Alternatives for Making, 2024).

Interesting results were obtained from another study and research. Together with his colleagues, R. Smiderle (Smiderle et al., 2020) demonstrated that gamification in education affects users differently, depending on their individual personality traits.

A variety of digital tools are available for gamification and for obtaining real-time information and providing feedback. However, «Kahoot» remains one of the most popular educational game platforms, which is also used for teaching and assessing students' knowledge.

The platform allows you to easily create, publish, and use educational games, quizzes, and various interactive tests and surveys, making the learning process engaging and dynamic.

As of November 2023, «Kahoot» reported that its platform had been used by over 10 billion people across 200 countries and regions. It has become a widely recognized tool for organizing quizzes, engaging over 8 million educators, thousands of schools, universities, millions of students, families, and lifelong learners. Moreover, it is used by thousands of businesses, including 97% of the Fortune 500 (the list of 500 largest American companies compiled by Fortune magazine) (Wang, Tahir, 2020; Kahoot! reaches milestone, 2023).

Today, users are offered two versions of the platform: a free (basic) version and a paid one. The latter includes various subscription options such as Kahoot+Bronze (50 participants), Kahoot+Silver (100 participants), Kahoot+Gold (200 participants), and Kahoot+One (400 participants). To participate in Kahoot quizzes, students can use any digital device by entering a unique PIN or scanning a QR code generated for each new participation.

It is worth noting that "Kahoot» database includes numerous ready-made free quizzes (tests) on various topics. The number of sports-related quizzes exceeds 1,000. However, these are primarily designed for general education or non-specialized university students interested in sports and are basically more general and accessible.

There is an opinion that the platform is best suited for revising and reinforcing knowledge rather than solely for assessments (Kozlova, 2022).

Madej M. and Studniarek M. (2020) believe that using the Kahoot application in education allows teachers to create a more engaging learning environment, conduct lessons in a more creative way and quickly receive feedback after each task. The use of the platform also improves students' results during exams.

Some researchers highlight additional advantages of "Kahoot», such as the ability to download, view, and save results. However, there are also some disadvantages that lecturers and students should be aware of: a limit on the number of characters used in questions and especially in answers, and inability for lecturers to suggest open-ended questions or receive open-ended answers (Plump, LaRosa, 2017).

A meta-analysis by O. Özdemir (2024) revealed that "Kahoot» positively impacts academic performance, attention retention, motivation, and can reduce anxiety. It creates a more student-centered environment and encourages active participation. Educators can use «Kahoot» to design more interactive, student-centered, and dynamic educational environment that meets the diverse needs of students.

Such studies have been conducted among pupils of various age groups. For example,the organization of game-based learning using "Kahoot» and "Quizizz» in a third-grade elementary school revealed that "Kahoot» significantly influenced students' scientific achievements. The authors recommend using this

platform as a teaching tool starting from the third grade. They also suggest that teachers' professional training should be considered to fully and effectively use this tool (Jankovic, & Lambic, 2022).

However, we believe that testing such platforms among 9-year-olds is not entirely justified, considering their limited ability to read and comprehend questions quickly, the short time available for thinking and navigating the answers, and the unequal access students have to properly and effectively use technical devices.

R.Mustagis's (2024) research revealed the effectiveness of teaching English using «Kahoot» among 21 7th grade students in one of Indonesian schools. It was found that it can be easier for students to master different word lists. It is also noted that this is an innovative method of organizing the teaching and learning process, which has advantages compared to «Google Forms» and is distinguished by the offer of many options, and makes the learning atmosphere in the classroom more «alive», dynamic.

Another experimental study revealed that many 7th grade students (Villanueva L. et al., 2022) showed little interest in engaging with the studied topics during online English lessons when their teacher used traditional teaching tools in their classroom.»Kahoot» educational application was used to evaluate the students' progress. As a result, it has been proven that the use of the platform contributed to the increase of students' activity. At the same time, this platform was more effective, unlike "Google Forms", where students are passive and not motivated in the learning process, especially regarding the assessment.

Positive experiences with «Kahoot» have also been observed in Postgraduate Programme. It was found that learners welcomed the use of the platform in the learning process (Plump, LaRosa, 2017). The authors emphasize that, through real-time feedback, lecturers can adjust the teaching process based on the level to which postgraduates understand the content of the tests.

As positive examples of the use of "Kahoot", let us present the results of experimental research carried out in general and higher education sectors of Armenia. Specifically, during history lesson of the 11th grade, "with the implementation of this platform, it was possible to reveal that as a formative assessment tool it involved all students of grades from 9 to 10 in the educational process. According to V. Hovhannisyan, the use of this platform demonstrated significant improvements, proving its positive impact on formative assessment (Hovhannisyan, 2022). Student feedback on the use of the platform was also overwhelmingly positive: thus 86.4% rated the «Kahoot»-based lessons as excellent, 81.8% found them very interesting, and 59% considered it an excellent teaching tool and a great way to test acquired knowledge.

However, the author does not clarify many important aspects related to the use of the platform - such as the version of Kahoot used (Classic mode, Treasure Trove, or others), the number of questions, the time allocated for responses, and so on. This raises numerous questions for potential users of the platform in Armenia.

At Yerevan State Medical University, "Kahoot» was used in 2023 during Physiology exams. Each Kahoot contained 40 questions with one correct answer out of four options. Depending on the complexity of the task, the time allocated for responses ranged from 30 to 120 seconds. H. Abrahamyan found that the average subject knowledge score in the group that used the platform was 7.02 out of 10, while the groups that did not use "Kahoot" had an average score of 6.58. The author believes that this tool is useful for motivating students, engaging them in the learning process, and improving academic performance, ensuring necessary and effective communication throughout the term (Abrahamyan, 2023).

In the context of this study, we believe that using only the four-answer format may have significantly increased the stress levels of students during the testing process. It would have been more appropriate to combine such multiple-choice tasks with alternative question types, such as 'true' or 'false'.

Sh. Licorish et al. (2018) carried out a research among students at a Research University in New Zealand at «Information Systems Strategy and Management» course.

It has been revealed that the use of «Kahoot» enhances the quality of education, significantly impacting engagement, motivation, and the improvement of the learning process. The results indicate that the use of educational games in the learning process minimizes distracting factors. Consequently, the quality of learning and teaching improves compared to traditional teaching forms and methods.

There is a research related to the impact of «Kahoot» on improving students' practical skills during the study of Statistics in the second year of Bachelor's degree (Shaker et al., 2021). It was found that «Kahoot» had a significant positive impact on increasing students' confidence and reducing anxiety. While the plat-

form's effect on anxiety was positive, it was not so strong as its impact on confidence. One possible reason for this is the time-limited testing process, which may cause anxiety for some students.

«Kahoot» was also experimented in 2020 among 274 medical students at King Abdulaziz University in Saudi Arabia during their second year of general pharmacy study (Shawwa, 2023). The study showed that «Kahoot» is an effective and interactive educational tool that enhances students' engagement and motivation, improving academic achievements. The authors recommend using «Kahoot» in medical schools for lectures and other educational activities to provide effective feedback. According to the study results, 70.8% of respondents considered the platform a good learning tool, 67.9% noted improvement in their analytical skills, and 69.7% noted an improvement in their ability to remember information. Furthermore, 64.1% emphasized the platform's positive impact on their motivation (Shawwa, 2023).

At Indonesia Kupang State University, the opinions of 329 students from the Faculty of Education and Teaching regarding the effectiveness of «Kahoot» were studied (Petrusly et al., 2024). The authors concluded that this platform-based teaching process is highly important for motivating students, fostering engagement, and improving their critical thinking skills. The use of gamified elements, such as points, rewards, and competitions, encourages students actively participate in the learning process. It was also found that students' critical thinking skills are directly linked to their motivation and engagement in learning, driven by the introduction of gamification process in the educational process.

According to R. Tsarev's (2017) research, the introduction of gamification technology using «Kahoot» in the educational process of first-year and second-year students during the study of «Computer Science» and «Information Technology» courses yielded positive results. 82% of students welcomed its use in the educational process, 88% found it engaging, and only 8% opposed the application of this platform.

It can be noted that in both general and higher education, the positive aspects of using «Kahoot» for teaching various subjects far outweigh the negative ones. Moreover, the competitive element makes the process more interesting and motivating.

In particular, the game can sometimes crash, causing a participant to drop out of the session and potentially feel discomfort as a result (Teacher's Edition: Kahoot – App Review, Pros and Cons). Nikolaos Pellas (Pellas, 2024) notes that the fast-paced nature of «Kahoot» quizzes can lead to 'surface learning,' where students prioritize giving quick answers to earn points rather than deeply understanding the material. One of the drawbacks of the «Kahoot» platform is that in the process of knowledge assessment, it places emphasis on response speed rather than on 'pure knowledge'.

In addition, due to time limitations for answering questions, it is not possible to use complex questions that could more accurately assess students' knowledge of the material (Cons of Using «Kahoot! « in Classrooms, 2018). There is also the possibility that students may easily copy each other's answers.

Nevertheless, the advantages of «Kahoot» far outweigh its disadvantages. Moreover, the above-mentioned 'shortcomings' can be successfully addressed by organizing the process methodologically correctly, as demonstrated by the results of our study.

An important feature of this platform is that it provides participants with 11 different game modes that can be used for teaching, reinforcing, correcting knowledge, as well as for individual and group assessments.

It should also be mentioned that in the past, the maximum number of participants in the free version was limited to 10, but now up to 20 participants can join the free version of the platform.

4. Results of the experimental research of the online platform «Kahoot»

At the ASIPCS, the free «Classic mode» of «Kahoot,» primarily for individual participation, has been in use since the 2022-2023 academic year by the Department of Sports Pedagogy and Psychology. It has been used in teaching «General Pedagogy» and «Sports Pedagogy» for Bachelor Degree students, as well as «Pedagogy of Higher Education» in the Master's Degree.

Two types of text-based tasks were developed and used: true/false questions and multiple-choice questions with one correct answer out of four options.

It is known that the free version of the platform somewhat limits the possibilities of developing and using tasks. In particular, the free version does not allow the inclusion of more than one correct

answer.However, this did not significantly limit the possibilities of this version in the educational process.

In addition to following the tasks on their smartphones, each participant could also view them on the classroom screen, allowing all learners to track the progress of the quiz, their scores, and changes in rankings. This ensured that the knowledge assessment process was carried out using game elements, in a transparent and competitive atmosphere.

The experience of using «Kahoot» in seminars of the aforementioned subjects in the 2023-2024 academic year showed that from the very first use of the platform, the students welcomed and appreciated the use of «Kahoot» in their educational process. They were interested and eager to engage in testing and reinforcing knowledge (Chatinyan & Abrahamyan, 2024). The opinions Bachelor Degree students and Master's students aligned with the results of similar studies (Tsarev, 2017; Plump, LaRosa, 2017).

After trying the platform, learners no longer wished to return to the traditional seminar format, where typically only one student was involved in the knowledge assessment process, and the others mostly remained in the role of listeners.

To clarify the opinions of learners about the platform, an oral survey was conducted in May 2024 among second-year and third-year Bachelor Degree students and Master's students. The survey revealed that the overwhelming majority of students (over 92%) highly appreciate the capabilities of «Kahoot» in the educational process and actively and joyfully participated in the process of assessing their knowledge. During some seminars, students even wanted to be tested in the same way a second time to review, refine, and improve their theoretical knowledge.

A similar picture was observed among Master's Degree students, 95% of whom noted the advantage and high efficiency of the platform.

One significant advantage of using «Kahoot» is that it not only assesses the level of knowledge acquisition but also identifies incorrect answers, corrects them, develops the necessary theoretical competencies, and even fosters analytical skills and teamwork among students. Double assessments during a single lesson are also important, as they allow learners to improve and clarify their acquired knowledge, after which the percentage of incorrect answers significantly decreases, contributing to the consolidation of accurate knowledge.

Here's the opinion shared by a full-time second-year student A S : *«The electronic seminars held with «Kahoot» are more effective, as they allow athletes of the the institute who are attending training camps or are in other countries to participate in seminars, improve their knowledge levels, and receive objective assessment.»*

One positive aspects of using the platform is that, after testing, the entire group, as well as each individual student, can review quantitative and qualitative (percentage-based) indicators of correct and incorrect answers for each question. At the end of a «Kahoot» session, the lecturer receives a detailed report on students' performance. This not only enables knowledge assessment but also helps identify difficulties students face with specific topics. As a result, additional classes can be organized on the same topic or subtopic.

Another significant application of «Kahoot» should be noted. When university student-athletes are unable to attend a seminar, they can use a PIN or QR code provided by their fellow students to join the session from another location using their smartphones.

It should be added, that the platform also creates opportunities for group work and collaboration by providing six different modes for this purpose.

It is worth noting that the time allowed for answering questions was set by the lecturer in advance, with specific durations assigned to each question on the platform. Until the first half of 2024, the time options for answers were limited to 5, 10, 20, or 30 seconds, as well as 1, 2, 3, or 4 minutes. However, in the second half of 2024, an additional 45-second and 1.5-minute option was added. This made it possible to use a more flexible and differentiated approach to choosing the duration of answers, taking into account the complexity of the question, the number of answer options, the educational level of the learners (bachelor's or master's degree), and other circumstances and factors.

In order to study students' opinions , an oral survey was organized with them before conducting the online survey, which included only one question: "How would you rate the conduct of seminar sessions through Kahoot?"

As a result, it turned out that 94% of full-time and part-time learning Bachelor's Degree students and 98% of Master's Degree students highly appreciated the use of the gamified technology «Kahoot» in the teaching process of their subjects and to study the opinions of learners, an oral survey was carried out

before an online questionnaire. The results showed that 94% of full-time and part-time Bachelor's Degree students and 98% of Master's Degree students highly appreciated the use of gamified technology in their course process and wanted such an interesting and effective tool to be used in other courses at the institute.

To gain deeper insights into Bachelor's and Master's students' opinions about the use of the «Kahoot» platform in the educational process, an online survey was made using Google Forms in the 2024-2025 academic year. The questionnaire consisted of two groups of questions, with total 14 questions. Quantitative and qualitative approaches to assess the responses were implemented.

According to the analysis of responses, the vast majority of Bachelor Degree students and Master's students (97.2%) stated that the platform makes the educational process more engaging, enabling not only to check but also to correct and reinforce the acquired knowledge. 94.4% of Bachelor Degree students and 97.2% of Master's students believed that the knowledge assessment process with «Kahoot» was carried out in a competitive atmosphere.

When examining the respondents' opinions on the ways of organizing the knowledge testing process, it was found out that 56% of Bachelor Degree students and 47.1% Master's students, respectively, would prefer to participate in seminars both individually and in groups. However the percentage of Bachelor Degree students and Master's students who wanted to participate in seminars individually was also high, 33.3% and 39.9%, respectively.

It was important to find out respondents' perceptions of the positive and negative aspects of «Kahoot». The majority of students (94.4%) believed that this seminar format motivated them, while 52.8% of Master's students shared the same view (Figure 1). Both Bachelor Degree students and Master's students highlighted the significant fact that such seminars were held without stress and tension(responses were 61.1% and 52.8%, respectively), and therefore it becomes possible to focus on the essence of the questions and choosing the correct answer.

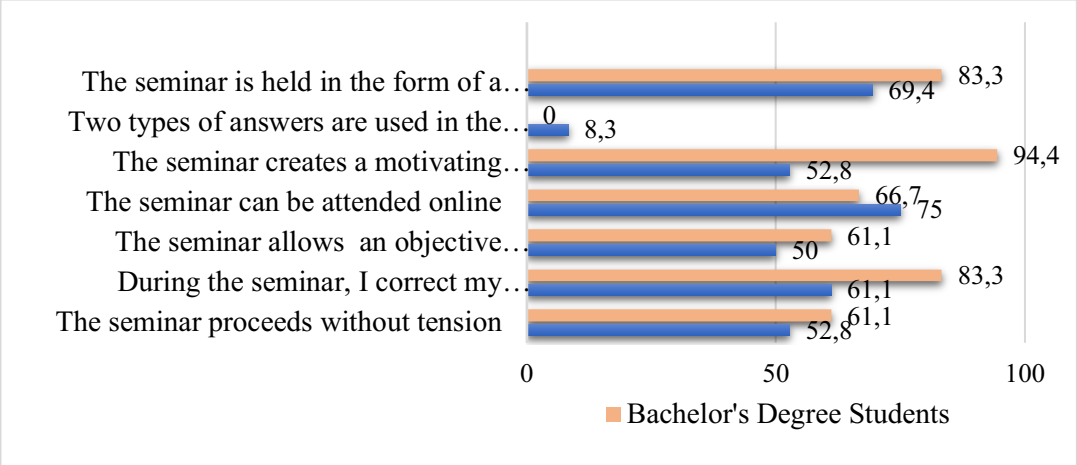

Fig. 1: Opinions of Bachelor's Degree Students and Master's Degree Students Regarding the Positive Aspects of «Kahoot» (in - %)

These responses from both groups once again underscore the importance of using gamification technologies in the educational process, which creates opportunities to participate in the reinforcement and improvement of knowledge without stress and tension and with high engagement. These opinions fully align with the results of other studies (Top 10 Free Alternatives, 2024; Tsarev, 2017).

The opinions of learners at ASIPCS regarding the motivating role and the importance of gamification elements of "Kahoot" fully align with the results of other studies conducted among pupils and university students (Abrahamyan, 2023; Sh. Licorish et al., 2018; Villanueva et al., 2022; Özdemir, 2024).

The opinions of respondents regarding the negative or problematic aspects of using «Kahoot» (Figure 2) revealed that most of the issues were related to unstable internet connections. This was mentioned by half of the Bachelor's degree students and 80.6% of Master's degree students. In fact, this was indeed the case, as there were instances during the use of the platform when the entire group or individual students were disconnected from "Kahoot" or left out of «Kahoot.»

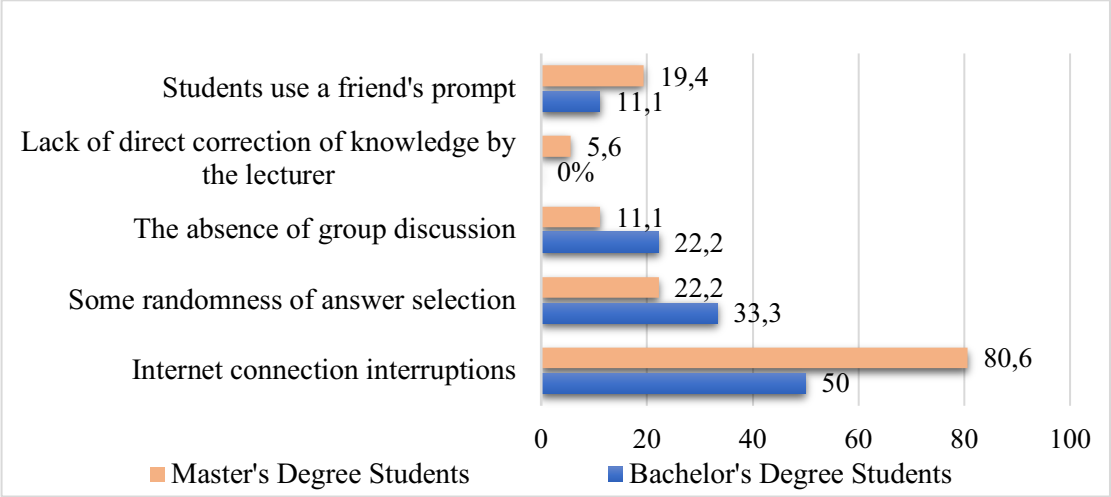

Fig. 2: Opinions of Bachelor Degree Students and Master's Degree Students Regarding the Shortcomings of «Kahoot» (in -%)

The second most commonly mentioned issue was related to the possibility of selecting the correct answer randomly, as indicated by 33.3% of students and 22.2% of the postgraduate students. This is one of the testing process challenges. However, based on the methodological approach developed by us and described below, it is possible to minimize this problem.

At the same time, 22.2% of the Bachelor's degree students and 11.1% of Master's degree students noted the lack of opportunities for group discussions of tasks as a shortcoming of «Kahoot.»This is partially true if the seminar is organized in an individual format. However, the platform allows you to organize a knowledge test by choosing any of 6 group options. This enables collaborative discussion of tasks, which not only clarifies and reinforces knowledge but also helps to develop teamwork and collaboration skills.The lowest data regarding the platform's drawbacks were related to the lack of opportunity for correcting knowledge during seminars, which accounted for 5.6% and 0% among master's students and undergraduates, respectively.

During the survey, it was also important to reveal learners' opinions regarding the effectiveness of organizing seminars through «Kahoot» compared to traditional methods of knowledge testing.It should be noted that in the latter case, the lecturer assesses the knowledge of an individual student through direct questions. The assessment was carried out on a 5-point scale, where 5 is excellent and 1 is very poor. Analysis of the results revealed that all ratings given to the «Kahoot» platform for both bachelor's students and master's students were in the range of 4 and 5 points, while Master's students assessed the effectiveness of the traditional method of knowledge rated as 2-5 points (Figure 3,4).

It is interesting that Bachelor's students and Master's students rated the effectiveness of using «Kahoot» equally high. However, 83.3% of Bachelor's students rated its effectiveness with highest score of 5 points, while only 69.4% of Master's students rated the effectiveness of this platform as excellent. On the other hand, the distribution of scores of 4 showed different tendencies: 16.7% of Bachelor Degree students and 30.6% of Master's students gave this score.

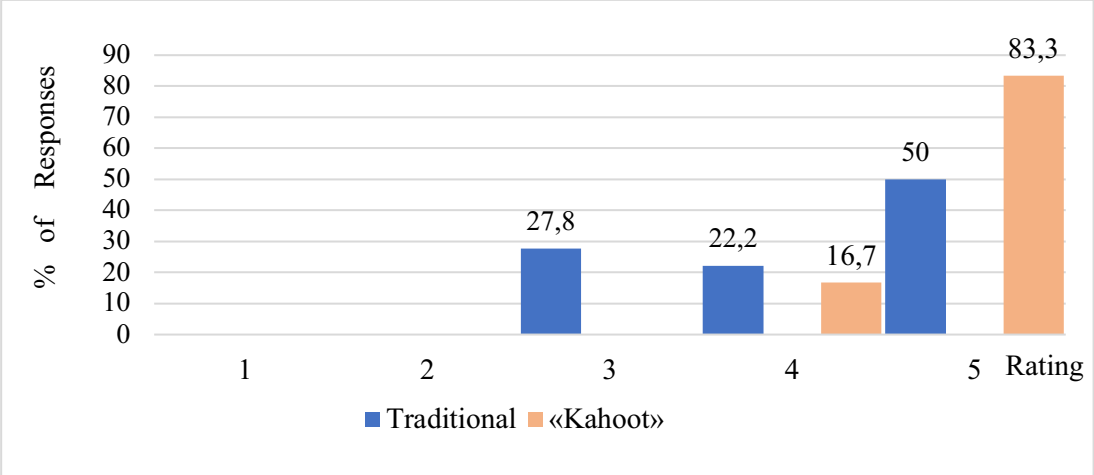

Fig. 3: Bachelor Degree students' opinions on the effectiveness of seminars held traditionally and through «Kahoot» (5 = excellent)

Overall, it can be stated that according to the survey conducted via «Google Forms,» both Bachelor Degree students and Master's students preferred the «Kahoot» platform when it came to organizing seminars.

It is noteworthy that master's students evaluated the use of the two organizational forms of conducting seminars more diversely. In particular, 5.6% of them rated the traditional form of seminars with a score of 2, probably considering that in modern conditions the use of digital technologies in the educational process is appropriate, more effective, engaging and has a number of other advantages.

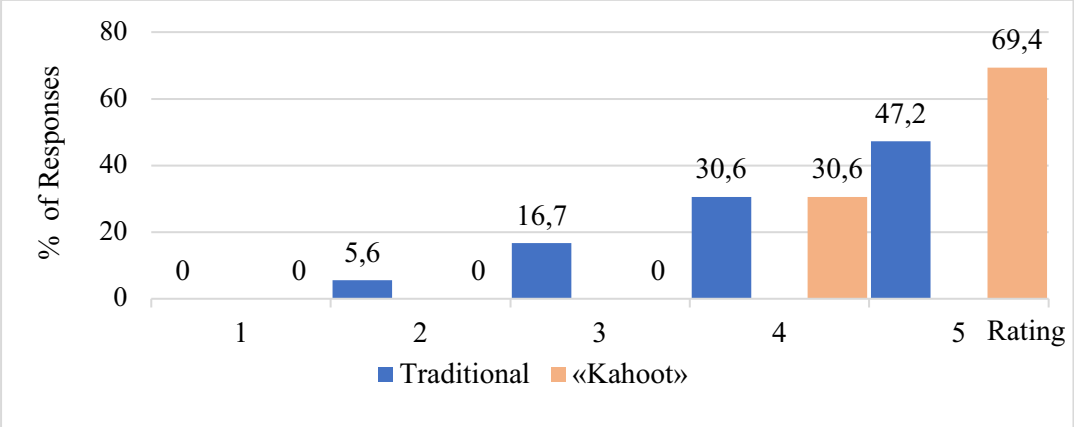

Fig. 4: Master's Degree students' opinions on the effectiveness of seminars held traditionally and through «Kahoot» (5 = excellent)

The research results also revealed that 97.2% of Bachelor Degree students and Master's students believe that lessons organized with the use of «Kahoot» are interesting and contribute to reinforcing acquired knowledge (100% of responses).

To ensure a more effective and operational assessment, reinforcement of knowledge, and enhanced objectivity in the assessment process, students were informed about the knowledge assessment system prior to the start of the testing process.

5. Discussion

It is necessary to understand the purpose of using various electronic platforms and the specific features of their content, for which a comparison of these platforms was conducted.

It is well known that the Kahoot platform enables real-time organization of quizzes, polls, and games.

The gamified format of content delivery increases students' motivation and enhances their participation in the learning process (Kahoot: Top 4 of its alternatives (2025), Bhuana G., 2023,Teacher's edition Kahoot: app review, pros and cons.).

Quizlet is used to reinforce the memorization of terms and concepts and offers various formats of exercises; however, it lacks the competitive component that is characteristic of Kahoot (Amanda Cappon, The Benefits of Quizlet, 2018).

The Mentimeter platform allows the creation of interactive presentations with options for polling and feedback. It is used to engage the audience, especially in online formats, but lacks a distinct gamified component (Mentimeter, (2024), Kahoot: Top 4 of its alternatives).

The Socrative platform is used for testing and assessing students' knowledge. It provides detailed analysis of results and is suitable for monitoring material comprehension; however, from the perspective of content delivery, it is not as engaging for students (Suryani, Fauziati, 2022). Kahoot stands out significantly from other platforms in terms of the learning experience.

Kahoot differs significantly from other platforms with its gamified learning format, which makes it particularly effective for engagement and knowledge assessment. Unlike the more academic and structured nature of Quizlet and Socrative, Kahoot demonstrates greater dynamism and motivates learners, while compared to Mentimeter, it offers more structured educational content (Comparison of Services for Educational Quizzes: Kahoot and Quizizz, Top 5 Kahoot! alternatives in 2025,).

For this reason, Kahoot is considered by many researchers to be an effective tool for enhancing motivation, repetition, and monitoring in the educational process.

Based on the analysis of the experiment using «Kahoot» and the feedback from respondents (Figure 1,2), the following changes were made. Initially, a student's rank and total score were considered; however, later, these factors were disregarded. Instead, the percentage of correct answers was accepted as the assessment criterion.

This approach created equal conditions for all students, as previously, faster-thinking students had certain advantages over those who processed information more slowly.

The approach we applied was only introduced by «Kahoot» in May 2025 under the name «Accuracy Mode». This important change which was introduced late means that participants earn points not for answering quickly and correctly, but solely based on the number of correct answers. This approach enables learners to 'think critically and choose the correct answer with greater confidence,' significantly reducing the chance of random guessing» (Harris, 2025).

Since knowledge assessment during seminars at the Armenian State Institute of Physical Culture and Sport (ASIPCS) is typically carried out on a maximum 10-point scale, the following approach was implemented. For instance, in a «Kahoot» quiz with 10 tasks, achieving 100% correct answers the student received 10 points. Each correct answer accounted for 10% of the total and was equivalent to 1 point. In case of 50% correct answers, the student would receive 5 points.

A unique system for assessing students' knowledge through «Kahoot» was developed. In this system, a student needed to achieve at least 55% correct answers (55%rounded to 60%) to earn 6 points.With 65% to 74% correct answers, the student would score 7 points out of a maximum of 10, and so on. Since «Kahoot» displays each student's individual percentage of correct and incorrect answers on-screen, this approach ensured transparency and simplicity in the assessment process.

To exclude random correct answer selection and simultaneously correct and increase knowledge level, the following methodological approach was used. To justify their choice of correct answers, students were asked to explain the errors or inaccuracies in the incorrect (unselected) options.

If the students could not prove or explain their chosen correct answer, thus revealing that the correct answer was selected randomly,their percentage of correct answers was reduced by a certain amount at the end of the seminar. For example, in a quiz with 10 tasks, the value of each correct or incorrect answer was 1 point. For each correct but unjustified, not explained answer, 1 point was deducted from the total score. Specifically, if a student achieved 75% correct answers (8 points) at the end of "Kahoot" but failed to explain one correct answer during the test, 1 point was deducted, resulting in a seminar score of 7 points.

Since the students were informed of this approach at the beginning of the seminar, it ensured transparency and objectivity in the assessment process, encouraging them to take testing more seriously.

Later, a second, more simplified method of knowledge assessment was developed, where only the num-

ber of correct answers was calculated. For instance, in a quiz with 10 tasks, the student received 1 point for each correct answer, 2 points for 2, and so on. In a quiz with 15 tasks, each correct answer was worth 0.7 points. This approach made it possible to assess learners' knowledge in a more differentiated way, starting from a minimum of point, depending on the number of questions.

It should be noted that both proposed methods can be successfully applied in the educational process, and the choice between them depends on the course , educational degree (undergraduate, graduate, or doctoral), as well as the mode of study (full-time or part-time).

During the 2024-2025 academic year, the use of «Kahoot» continued in the full time and part time teaching within the scope of the subjects taught in the previous academic year. In the second phase of the study, some corrections were made during the question answering period. This was due to the older age of students involved in part-time learning system, especially master's students (average age: 35), as compared to full-time students, as well as based on the analysis of the results of the questionnaire. Therefore, the response time was extended to 30-45 seconds, and in some cases up to 1 minute, the expediency of which was confirmed during subsequent seminars.

Additionally, some classes included the option to hold the seminar in a group format using «Kahoot.» This approach also engaged students, particularly due to the presence of game elements and the creation of a competitive atmosphere between groups.

Let us present the opinion of a second-year part-time student K.K. about this platform:*»Being an educator and currently a part-time student at ASIPCS, I have participated in many seminars. However, I have never been as impressed with any seminar format as I have been with «Kahoot». It is an interesting, engaging, and highly effective approach for testing and improving knowledge, implemented in competitive conditions and motivating all of us. Thank you for organizing such unique seminars!».*

6. Conclusion

The use of the «Kahoot» in the teaching process for second-year and third-year Bachelor Degree and Master's Degree courses in full-time and part-time modes of study at ASIPCS revealed that 94% of bachelors and 98% of masters highly appreciate the use of such a learning platform for testing knowledge in the educational process.

Bachelor Degree students and Master's students note that the main advantages of using «Kahoot» are that the platform makes the learning process interesting, and it allows them to not only check, but also correct and improve the acquired knowledge.

Respondents emphasized the importance of the competitive atmosphere in the process of testing knowledge through «Kahoot».

As disadvantages of using the platform, most students mention the unstable internet connection, as well as the possibility of randomly selecting the correct answer.

It should be added that the platform allows not only to conduct formative assessment of knowledge, but also contributes to its clarification and improvement. At the same time,by using the form of the group version of the platform, it is possible to develop and improve group thinking, collaboration, and group decision-making skills.

The results of our study align with those of other researches on the use of «Kahoot», confirming the platform's numerous advantages in the field of higher education. At the same time, a new approach to knowledge assessment, based solely on the number of correct answers, was proposed and tested.

Further research is planned to explore the capabilities and application specifics of the platform within the context of the studied subjects at ASIPCS, using «Kahoot's» team mode and developing an appropriate knowledge assessment system. In the future, the effectiveness of the Kahoot platform is also planned to be studied within the academic process of the institute's postgraduate students.

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