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# Kahooting and Learning: A Study From Macedonia and Norway

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**Abstract:** This paper presents research at the elementary level concerning using Kahoot! game amongst 12-13 years old students both in Macedonia and Norway. The quiz game Kahoot! was developed in Norway at a Norwegian University and has been successfully distributed worldwide. Students and teachers were using Kahoot! in the classrooms and after that the research was conducted concerning achieving students' learning outcomes. The data concerning students' opinion has been collected through a survey taking into account different parameters that influence on qualitative integration of game in the learning process, like students' attitudes, opinions and interactions during the game, game's ease of use and the use of a game for achieving educational goals. Our research has been focussing on how teachers have approached the use of Kahoot! in their classes, too. The data concerning teachers' opinion about using Kahoot! in the classroom has been collected through interviews. This mixed methods approach (e-mail and phone interview) to collecting data provided a rich picture of the use and the reasons for using Kahoot! to support achievement of students' learning outcomes. The results from the survey conducted with students were quite similar in both countries, but Macedonian students being slightly more positive about kahooting. The vast majority find the game fun and motivating, they like the competition, playing with their classmates and learning from the kahooting. The teachers are positive about using Kahoot! and even if it takes time and effort to develop the questions and answers, the teachers find it useful. They use Kahoot! to activate the students and to "break up" classroom teaching, but also to test competency-levels and discover problem areas that needs further attention and repetition. The research's data indicate that Kahoot! can be used in the classroom for learning, creating motivational and competitive environment. Teachers can find different way to include Kahoot! in the classes and students enjoy this game based learning approach.

**Keywords:** game based learning, Kahoot!, quiz game, Educational Game Evaluation Framework, quality of experience

## 1. Introduction

Children play games from an early age with a lot of focus, energy and enthusiasm. This commitment should be transmitted to the learning in school. By using digital games, new and powerful ways of learning in the classrooms can be created. These interactive collaborative experiences can increase engagement of students in the learning process and thus, learning outcomes can be achieved more easily. Enjoyment and fun as part of the learning process are important since the learner is then relaxed and motivated and therefore more willing to learn. Digital games offer students opportunities to reach goals that are not focused just on learning facts, but enable development of skills such as problem solving, decision making and strategic planning at the same time. (Lymbery, 2012)

An attractive element of the gaming experience, as a learning tool is that it provides opportunities for continuous practice because negative consequences are not typically associated with failure. In that way, failure serves as an integral part of the learning experience. This encourages students as players to improve through repeated practice either by advancing within a game or replaying parts of a game. This constructive feedback enables students to improve their work (McClarty et al, 2012).

Mobile devices are becoming an increasing part of our daily activities and have made their entrance in the world of education (Wali, Winters, & Oliver, 2008). The learning potential of mobile and location based technologies lies in the possibility to embed learning in an authentic environment, enhance engagement and foster learning outside traditional formal educational settings (Huizenga et al, 2009). The use of mobile games in education may be an excellent way to combine situated and active learning with fun.



Games, for instance mobile learning games, foster deep personal engagement. The games can also support collaborative problem solving, and it can encourage active participation and knowledge building. This provides the teachers with a tool for active learning. Games also offer a different kind of motivation. Students that easily give up on tasks due to a high difficulty level may spend hours on solving an equally difficult issue in a game (Jenkins, 2005). This motivation that a game offers with regards to persistence towards solving problems should be taken more seriously with regards to bringing it into the classroom.

The purpose of this study is to identify potential benefits and issues related to integrating Kahoot! quiz game in education. Students' and teachers' attitudes towards using this popular quiz game in the learning process are evaluated.

Quality of students' learning experience while using Kahoot! was evaluated by using simplified evaluation framework. The International Telecommunications Union defines Quality of Experience (QoE) as "the overall acceptability of an application or service, as perceived subjectively by the end-user". In this paper, QoE is recognized as a multidisciplinary concept about students' acceptance of using quiz games in education based on game popularity, cognitive experience and subjective feeling.

The Educational Game Evaluation Framework (Figure 1.) has been developed to identify factors that influence students' quality of experience during use of educational games in the learning process. These factors are complex variables that can be divided in two categories: game rating as the necessary element for a game to be accepted by the students (popularity of the game, which influence on games' ease of use) and students' motivation and attitudes (which are affected by educational elements, too). Age can influence the student's motivation and attitude to learn using certain game.

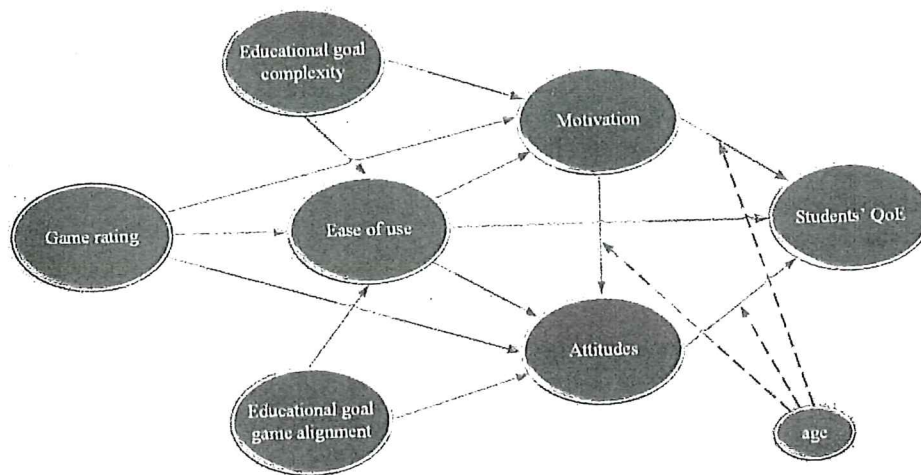


Figure 1: Educational Game Evaluation Framework

The main idea of Educational Game Evaluation Framework is that achieved quality of students' experience while playing the game is in positive relation with the students' motivation, attitudes and games' ease of use. These factors depend on other parameters like game rating, alignment of the educational goal with the game, and educational goal complexity. It is important to note, that different factors such: cultural background, age, knowledge in certain area, can influence the student's appreciation, too.

For this paper we are using the simplified Educational Game Evaluation Framework and our research is based just on investigating students' motivation and attitudes towards the quiz game. Other factor are just mentioned and the correlation among them is not part of the research. The idea is just to see whether Kahoot! can be used in the classroom and how it influence on students' quality of learning experience by determining their motivation, attitudes and game's ease of use. Also, we have made research concerning teachers' attitudes towards using Kahoot! on classes. We were particularly interested in comparing the results between schools in Macedonia and Norway, and gender issues.

In the next section the short introduction to the quiz game Kahoot! is presented. The third section describes the used methodology. Results and discussions are presented in the fourth section and the last one draws conclusions.



## 2. The quiz game Kahoot!

Kahoot! is a quiz game ([www.getkahoot.com](http://www.getkahoot.com)) developed at the Norwegian University of Science and Technology and has since its origin obtained a global success. It was quickly picked up by teachers and has been used in education for some time. According to their website, Kahoot! is used in all countries in the world and at the end of 2017 they had 70 million monthly users.

Kahoot! is a game-based learning platform, used as educational technology in schools and other educational institutions. Its learning games, "kahoots", are multiple-choice quizzes that allow user generation and can be accessed via web browser (Figure 2.). The Kahoot! game based learning platform offers opportunity for creating a quizzes or finding and adopting a quiz to particular audience. The creator of the quiz game gives a code for playing and it can be played in single mode or team mode.

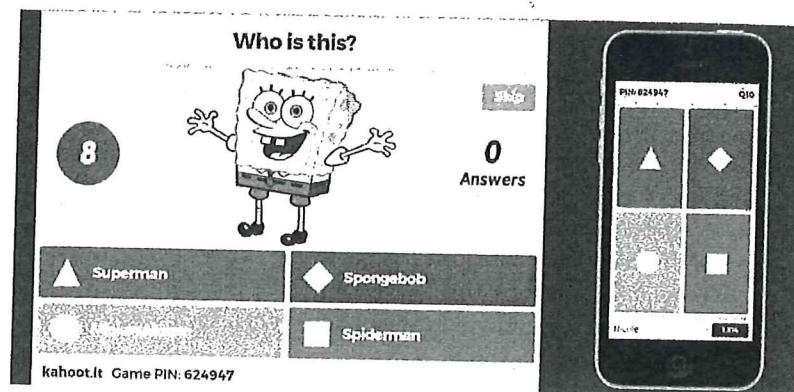


Figure 2: Interface of the Kahoot! quiz game

The game can be played as a pre-generated quiz or in a classroom with the teacher as a "game master". The students can access the game by logging on from a pc, iPad or mobile phone. By entering a game pin generated by the quiz game, the "game master" can start the quiz and decide on when to display the next question.

A scoreboard is optional, but many students like to see how well they are doing. The students are given an opportunity to rate the game and learning outcome after playing.

## 3. Methodology

The Educational Game Evaluation Framework has been adapted to suit the quiz game in order to explore how students perceived Kahoot! in the learning process. The adapted version was developed into a survey using the tool Questback in order to collect and analyse the data. This quantitative research method allowed us to compare the answers from the two countries, Macedonia and Norway.

The survey consisted of 14 questions. First part of the survey consisted of questions about background data, such as gender, how often they play games, how often they play games from mobile phone or tablet and if they had any previous experience with Kahoot!.

The other questions were designed to measure students' attitudes towards Kahoot! using a five-point Likert scale (Bowling, 2014; Grove et al, 2015), with answer choices ranging from "strongly disagree" (1) to "strongly agree" (5). The results were used to obtain information about students' quality of experience (QoE) in using Kahoot!. We tested game's ease of use, students' attitudes towards playing the game, their motivation and possibility to learn by using Kahoot! in the classroom..

The data concerning teachers' attitude were collected using a variance of a mixed methods approach (Creswell and Clark 2007). An email - interview was sent to the Macedonian teachers and the questions served as a structured phone interview in Norway. The email-interview serves the purpose of a survey as the respondents only answer what is presented in the questions. They are asynchronous, cost effective way of collecting data. Although the interview is a more qualitative approach, email-interviews can almost be regarded as quantitative data collection (Ratislavová and Ratislav, 2014). It also allows comparing responses from other respondents. The data collected via email-interviews are regarded as rich and of much the same quality as what you can get in a face-to-face synchronous interview (Ratislavová and Ratislav, 2014). During the phone interview, it was easier



to follow up on different issues and clear up any misunderstandings. This is somewhat more difficult in an email-interview. However, best regarded is face-to-face interviews, but this was not possible at the time.

The questions of the interview concerned the approach for using Kahoot! in the class, how and when during the class the Kahoot! is mostly used, teachers' attitude towards educational value of the quiz game, collaborative and competitive elements, supporting of students' learning outcomes etc. This preliminary research of teachers' attitude towards using Kahoot! in Macedonia and Norway, will be a good base for further research on educational value of this quiz game and the most suitable implementation in the curriculum

#### 4. Results and discussion

Students aged 12 to 13 years took part in the research. A total number of students that participated was 46 (21 boys and 25 girls) from Macedonia and 43 (24 boys and 19 girls) from Norway.

Results from the survey show that 90,48% of the boys and 48,00% of the girls from Macedonia play games every day or very often. Situation in Norway is similar, 95,83% of the boys and 36,84% of the girls do this. Results concerning students' attitude towards playing Kahoot! are presented in Table 1. The mean value is calculated by adding up all the values from the student answers and then dividing that sum by the number of students.

Table 1: Results for students' attitudes towards using Kahoot!

Statements concerning using Kahoot!	Macedonia		Norway	
	boys	girls	boys	girls
Kahoot! is simple to use	4,81	4,92	4,38	4,74
I like playing Kahoot!	4,86	4,88	4,21	4,74
I think it is fun to compete using Kahoot!	4,76	4,72	4,08	4,63
It wasn't difficult to understand the questions	4,38	4,44	4,13	4,42
I am motivated to learn by using Kahoot!	4,71	4,64	3,79	4,26
I learn something when I play Kahoot!	4,52	4,68	4,08	4,47
I would like to use more games to learn	4,71	4,32	4,45	4,00
I wish we continue using Kahoot! during lessons	4,95	4,76	4,46	4,89

The results show that students find Kahoot ease to use. In both cases, Macedonia and Norway, girls find the game slightly easier to use than the boys.

Concerning students' attitudes and motivation towards using Kahoot!, Maacedonian students have more positive attitudes and are more motivated to use this quiz game in the classroom than Norwegian. There is no significant different in the attitudes between boys and girls in Macedonia, but this is not a situation in Norway. Girls in Norway enjoy more, have more fun and are more motivated playing Kahoot! than boys.

Analyzing the results about learning with Kahoot!, it is interesting that girls learn more than boys while playing Kahoot!, but boys prefer more this way of learning. The situation is the same in Macedonia and in Norway.

All students are positive about using Kahoot! and they would like to continue using the Kahoot! during the lessons. Generally, both boys and girls have very positive attitudes concerning the game, but Macedonian students have a bit more positive impressions towards the game than the Norwegians.

The results from the interviews with the teachers were unanimous; they like to use Kahoot! and they experience that their students appreciate it. One of the respondents also report that it is a good way of using the technology that the students are already familiar with. Regarding the use as a pedagogical tool, the teachers use it to assess students' learning, and to detect where they have problems, establishing guidelines for improvement. It is a good way to promote self-assessment among the students. The Macedonian teachers report on success with the randomized questions as this provided them with "data" for assessment purposes. With the random function they could better see where the students struggled. The Norwegians does not mention the random function.

Teachers find Kahoot! as a valuable tool for testing, and also for competitiveness. Letting the students compete enhances the engagement and their eagerness to do better. This may indicate that students focus more on the classroom learning as well. Used in team mode, the teachers register that the students help each other and this



support the social learning in the classes. The teachers claim that the students are more motivated, inspired and they learn more when using Kahoot!. Breaking up the classroom education by activating the students are welcomed both in Macedonia and in Norway. The teachers need time to create good questions and answers, and the time consumption always needs to be compared with other pedagogical features that is needed in their classroom. However, they are positive about spending this time as this is perceived as useful. This coheres with research on technology acceptance (Martí-Parreño et al. 2016). As long as the "return on investment" (output from the gaming in the class) is higher than the "cost" (time and effort spent making the Kahoot!) they are positive and accept spending the time and effort.

## 5. Conclusion

The research shows that the vast majority of the students enjoyed playing the quiz game Kahoot!. There were marginal differences between the two countries. However, the Macedonian students were slightly more positive than the Norwegian students. The majority also claimed to be motivated to learn, and that the quiz game supported their learning outcome. They also enjoy playing in the social setting of the classroom. They like competing with their mates, but they also enjoy working in teams. Making a connection with a Educational Game Evaluation Framework, the conclusion is that quiz game Kahoot! is easy to use, students have high motivation to use it, they have positive attitudes towards using it in education and it can be used for different educational purposes. Students enjoy the gaming, the competition, the classroom activity and the possibility to learn using this kind of a game in educational process. All these lead to a high quality of experience of students. Testing out the Game Evaluation Framework has been interesting, as the framework originally is developed for other types of games. It does, however, confirm our findings and it also provide us with valuable insight into the game based learning, showing how well students rate the games regarding quality of experience and achieving of learning outcome. The teachers are positive about using Kahoot! and even if it takes time and effort to develop the questions and answers, the teachers find it very useful. They use Kahoot! in different ways during the lessons, starting as introduction activity or as a summative assessment tool. It is a good way to evaluate students' learning and to discover areas that need to be improved. The collaboration and competitiveness are present all the time during the use of this quiz game. The collaborative learning aspect is important for developing supportive class environment, and competition is used motivate the students to improve their learning outcomes.

### 5.1 Further research

These preliminary research has shown great potential and the next step is to conduct a more in-depth study with more teachers. It would also be interesting to do research in other countries where teachers use Kahoot!. This would provide us with a wider array of data. The Educational Game Evaluation Framework could be further tested to see if different ways of using Kahoot!, e.g. team mode will have an impact on the students' quality of experience.

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