USE AND IMPACT OF KAHOOT IN LOGISTICS EDUCATION

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Abstract: *Nowadays, the younger university students are increasingly using digital solutions, therefore teachers should turn to these solutions as well. One of the tools for this is to use an online platform instead of paper-based solutions for short end-of-class assessments. There are several such available software on the market, and this paper presents the use and results of Kahoot through two case studies. The details of the case studies also show the impact in logistics education.*

Keywords: *logistics, education, online test, Kahoot*

1. INTRODUCTION

In addition to industrial processes, digitalization is now also indispensable in education. Presentation has been a well-known technique for a long time, but even nowadays the assessments are often paper based, which still has its advantages. The younger generation of students was born into the digital world, so for them the use of a smartphone and applications are already completely natural. Therefore, as an educator, it is also necessary to keep up with the times. In addition, digitalization and instantly available content also make it increasingly difficult to capture students' attention using traditional methods. Therefore, during the lessons, solutions are needed that direct the students' attention to what is said in class. In a simulation subject, this is a simpler task, but in a demonstration or lecture class it is a more difficult task. One means of capturing attention is taking notes, another tool is taking tests at the end of class. There are several ways to take a short online test, one of which is to use the Kahoot app [1]. Therefore, the topic of this paper is to present the use of this application and its impact through two case studies. The case studies also demonstrate the effects of application in the logistics field.

Kahoot is already used in many places [2]-[10]. Wang et al. focused basically on learning performance, but also classroom dynamics, students' and teachers' attuites and perceptions, and student anxiety. They included a high number, 93 different type of quantitative and or qualitative studies. They made the conclusion that Kahoot! has a positive effect on learning performance, classroom dynamics, attuites, and anxiety [2]. The paper written by Licorish et al. presents outcomes of research that examined students' experience in an Information Systems Strategy and Governance course at a research-intensive teaching university in New Zealand [3]. Wang et al. presented an experiment where they investigated how the use of points and audio affect the learning environment. Specifically, the paper presented results from an experiment where the same lecture was taught for different group of students [4]. Chaiyo et al. compared and contrasted and showed result from different learning systems, such as Kahoot, Quizizz, and Google Forms [5]. In the study of Tan et al., a cohort of undergraduates at a public university in Malaysia were exposed to the use of Kahoot!, a game-based learning platform, during their weekly lectures for one semester [6].

Also from Malaysia two different papers investigated the perception of students towards Kahoot as a formative assessment tool in undergraduate medical education and its association

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with gender [7]-[8]. Always interesting and important question is learning vocabulary, and a study showed that Kahoot can be a very helpful solution for this purpose [9]. Another paper highlighted, that such a learning platfrom can increase also the engagement and motivation for learning [10]. It is observed that it is used in many areas of education, not only in the technical field, but also, for example, in the field of health sciences.

After this introduction, the second section of this paper details how to use the Kahoot app, starting with registering on the site, continuing with creating the wish, and finally using the quiz. The third section of the paper presents two case studies in which Kahoot was applied to the audience at the end of two different lessons.

2. USING KAHOOT

This chapter details the creation of a Kahoot question sequence step by step and with explanatory figures. The Subsection 2.1. presents the registration steps. The Subsection 2.2 details the creation of a general quiz, while the Subsection 2.3 is about the use of the quiz among the audience.

2.1. Registration

The steps are necessary as follows:
1. Open the page https://kahoot.com/ in a web browser
2. Top left click "*Sign up*"
3. *Choose your account type – Select Teacher*
4. *Select describe your workplace – Higher education*
5. Enter e-mail address, password
6. Select *Continue for free*, i.e., with the Basic option
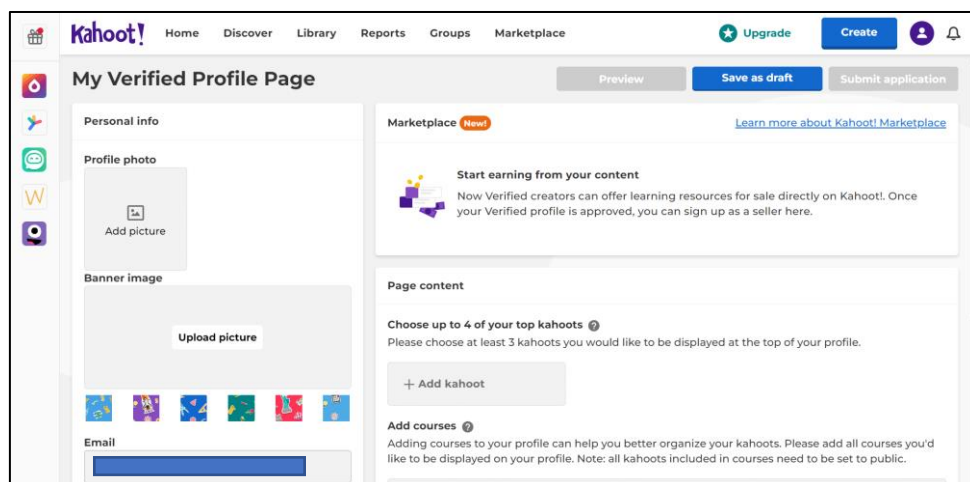7. The profile is complete, as shown in Fig. 1.

Figure 1. After successful registration

2.2. Quiz creation

After successful registration, further steps must be taken to create a quiz as follows:
1. Top right *Create / Kahoot*, in the window that appears again *Create*
2. Enter the question at the top and enter the answers as appropriate (see Fig. 2). The correct answer must be ticked.
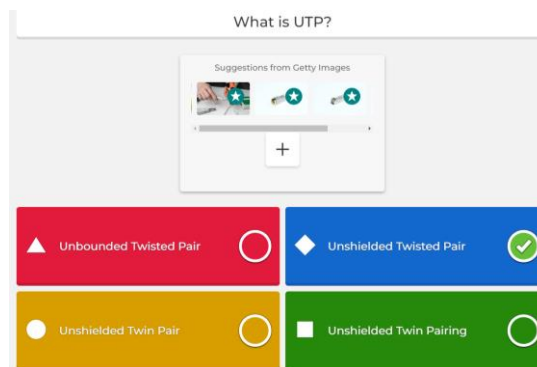

Figure 2. Creating first question and corresponding answer options

3. To add a new question on the left, "*Add question*" followed by "*Quiz*" as illustrated in Figure 3/a.
4. The additional question should be entered as in the first case.
5. Once the questions are ready, then at the top right *Save*, here need to enter the title of the quiz, as shown in Figure 3/b.
6. With this quiz done, it can be tested, filled out, shared it with others, or just closed the window.
7. After saving, the quiz will appear on the right.
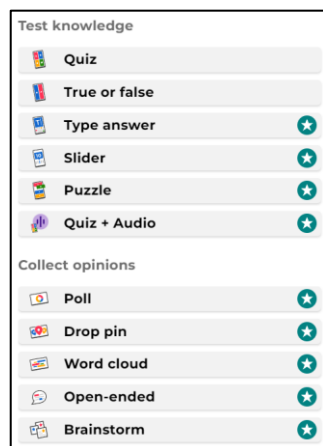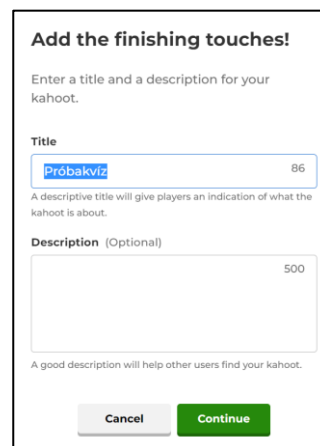
(a) *Options for adding another question*   (b) *Saving the quiz*

Figure 3. Options for adding another question and saving the quiz

2.3. Using a quiz

Students need to download the Kahoot app on mobile or open it from a web browser, in the latter case, open https://kahoot.com/ website and then log in with "*Sign up*" command on top left. For this, internet access is available at the place of filling.

Educators should share the screen to projector after setting up the quiz in order for students to see the data they need. As an educator, the steps to set it up: quiz by clicking *Play*, then *Classic Mode*, then the PIN code will appear, which students must enter. It is necessary to wait for everyone to log in, which can be seen on the screen, as illustrated in Fig. 4. For a smaller group, it is also possible to scan the QR code.
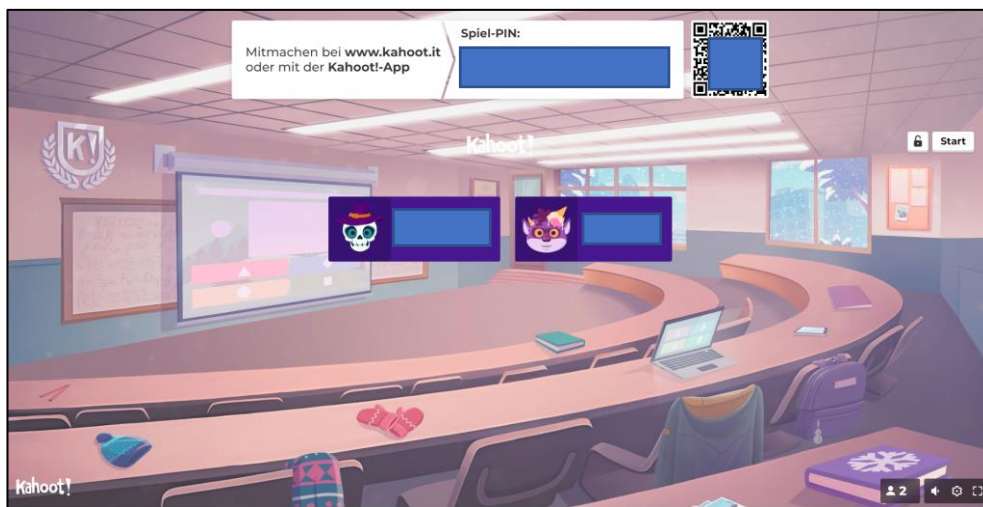

Figure 4. After setting up the quiz, with the PIN code and login details

As both an educator and a student, the steps must be followed accordingly. At the very end the results can be seen (see Fig. 5), declaring the winner. The results can also be viewed completely, at which point it is worth taking off the screen sharing to projector. Click on *Players* to see who scored what percentage. The report can also be accessed later using the Reports menu item at the top.
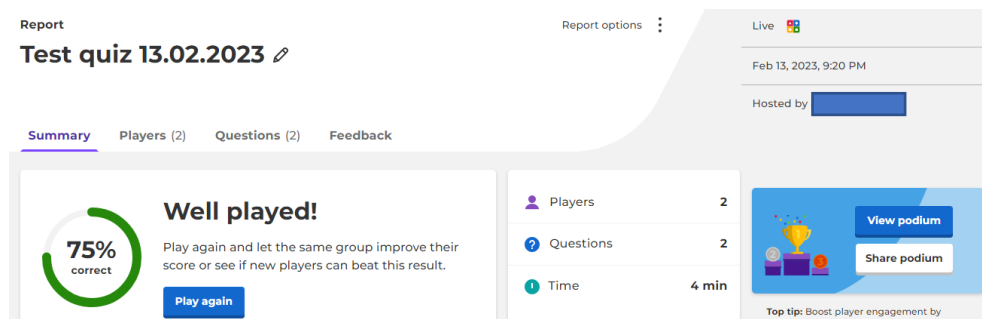

Figure 5. After taking the quiz, checking the results

3. EFFECT OF USING KAHOOT

This paper presents the results and impacts of Kahoot's deployment. In both cases, more than ten logistics engineering students completed the tests.

3.1. Case study 1

In this case, *Kahoot* was used first in the course, but despite of it was nevertheless successfully used. At that time, 15 students participated in the online assessment at the end of the class and 5 questions were asked. The topic of the lesson was product tracking systems.
The questions were as follows; the correct answers are highlighted:

1. question: What is one essential part of the concept of standard?
   - ... freely accepted general document, ...
   - **... a technical document accepted by consensus, ...**
2. question: Which is not an advantage of the standard?
   - Consumer protection
   - Sustainability
   - **Expensive**
   - Quality assurance
3. question: Which is not the meaning of GS1?
   - Global, System, 1 single common language of business life
   - **Global, Sustainability, 1 single common language in business life**
   - Global, Standards, 1 single common language of business life
   - Global, Solutions, 1 single common language of business life
4. question: What does GLN stand for?
   - Global Local Number
   - **Global Location Number**
   - Global Localization Number
   - Global Localist Number
5. question: What does GTIN stand for?
   - Global Trace Item Number
   - Global Trade Items Number
   - **Global Trade Item Number**
   - Global Trade Item Numbers

The first question contained a specific part of the concept of standard, the second question was an inverse question, and the third question focuses the meaning of the second letter of an acronym. It can be concluded that 13-14 students out of 15 students gave a successful answer, so class attention was strongly promoted. The fourth and fifth questions had to be answered with the meaning of an acronym. Here the correct answer rate is not so strong, 9-10 out of 15 students answered correctly. At the same time, this helps students better memorize each concept. It can also spotted that the questions became more difficult along the test process. However, it was necessary to catch the concentration of the students.

3.2. Case study 2

The second case study relates to the same course, but at a later time. At that time, 16 students participated in filling out the questionnaire and 6 questions were included. The class was about data transfer technologies.

The questions were as follows; the correct answers are highlighted:

1. question: What is UTP?
    *   Unbounded Twisted Pair
    *   **Unshielded Twisted Pair**
    *   Unshielded Twin Pair
    *   Unshielded Twin Pairing
2. question: What is the latest Bluetooth standard?
    5.3 / **5.4** / 5.5 / 5.2
3. question: What is WPAN?
    *   **Wireless Personal Area Network**
    *   Wireless Private Area Network
    *   Wireless Person Area Network
    *   Wired Personal Area Network
4. question: How many mobile network generations are there currently?
    3 / 4 / **5** / 6
5. question: Which of the Wi-Fi recommendations is the latest existing recommendation?
    802.11n / 802.11be / **802.11ax** / 802.11ac
6. question: What is GPS?
    *   Global Position System
    *   **Global Positioning System**
    *   Global Positional System
    *   Global Positioning Systems

The first question concerned an acronym, the second question asked the latest standard number for a well-used wireless data transmission technology, and the third question again asked for an acronym. It can be concluded that response rates are mixed depending on attention in class. Interestingly, the much less well-known acronym WPAN had a higher number of correct answers than UTP. In each case, the percentage of correct answers was higher than 50%. The fourth question asked about another wireless data transmission technology for generations, the fifth question asked about the current value of one of the most commonly used technologies, and finally the sixth question related to an acronym most commonly used in positioning. The answer rate for the fourth question was still high, but for the last two questions only about a third answered correctly. Since the students used formerly the Kahoot in Case study 1, the unknown factor decreased, however the questions were more difficult, therefore more concentration was used by the logistics students.

From the case studies it can be concluded that different methods should be used for creating questions: interchanging words, interchanging only letters, or using other meanings, all of them is an efficient way to test the knowledge of the students.

4. SUMMARY

This research included the application of one of the popular online education-based learning platforms. In this study, this platform appeared in logistics education. The purpose of using the questionnaire is to increase classroom attention, concentration, because without it, students tend to do other activities in class, which do not belong to the topic. The first half of the paper described the registration required for the software, the creation of the quiz and the use of the quiz after its completion. The second half of the paper presented the results of using the quiz in two pieces. It can be concluded that correct response rates were also higher in the first lesson due to higher student attention. In the future, it should be continued to use the application along the course.

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