

## **The experience of using the Kahoot! With students who are starting to program**

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**Summary:** This work introduces the Kahoot! tool, applied in the first year of the Information Engineering Systems career at the Universidad Nacional. In which the way the tool was used, the activities developed with it and the perception obtained by the students when using it are disclosed.

**Keywords:** Active Learning, Gamification, Kahoot!

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### **1. Introduction**

The Computer Science Fundamentals course is the first course of the Systems Engineering career of the Universidad Nacional, in which the objective is that students know the bases of programming, making use of the Object-Oriented Programming Paradigm. In this sense, during the course we see the concepts of sequential, conditional structures, unidimensional and bidimensional arrangements, topics that for the students sometimes are abstract

On the other hand, the new students who are currently entering the university belong to the generation called "Y" or "Millennials", this group of individuals is considered multitasking, since they do not understand reality without technology, they prioritize quality of life, they are entrepreneurs, they make use of technology for distraction such as: Internet, SMS, CD player, MP3, MP4, DVD among others; products that they considered as "basic". This generation, due to their characteristics in the use of technology, do not use the same learning mechanisms as students from other generations in the past [1].

Thus, new methodologies must now be sought to achieve the model of teaching and learning of the students. Within these methodologies, the use of active learning is recommended, which favors an active attitude of the student in class, as opposed to what happens in the classic expository method, in which the student is limited to taking notes of what he/ she sees on the blackboard. It is the process that empowers students to do things and to think about those things they do [2].

The proponents of active learning [3], point out that it is simply a matter of turning the traditional method in which educational content is presented in the classroom and practice activities are conducted at home. However, the inverted classroom approach points out that at home the student acquire knowledge and during the class they share the knowledge, while the teacher consolidates his or her learning.

Among the tools that allow for active learning is Kahoot! This is a free tool that has gained popularity among teachers for its ease of use and its ability to establish active working dynamics in the classroom [4]. On the other hand, Kahoot is a novel formative assessment tool that is feasible and practical to make learning fun and enjoyable, thus motivating students to learn. It is recommended that medical schools begin using Kahoot as an alternative formative assessment tool to nurture student learning [5].

When carefully designed, classroom games increase student motivation and engagement and ultimately improve learning. With its simple and intuitive game development tool, the Kahoot! platform allows instructors to bypass the technical obstacles they might otherwise encounter in developing a digital game and focus instead on the instructions in the results [6].

Authors such as Guibert, Guittet and Girard [7], state that students who face programming for the first time in their training process, show problems such as: they do not manage to develop a viable model or structure to solve the problem, nor describe a comprehensible strategy for the computer or abstract the different behaviors of a task into a strategy that integrates them all.

It is important to emphasize some contributions of the people who study computer science [8] which are: develops logical reasoning and problem solving, increases creativity, in which one must be able to have

ideas and then put them into practice, maintains a young and active mind, through the acquisition of new knowledge, develops leadership and group management skills.

In the following sections we present: the implementation of the Kahoot tool in the Computer Fundamentals course, the activities are conducted, questionnaire of the student's perception, main results and conclusions.

## 2. Implementation of the Kahoot! tool in the course and activities

The Computer Science Fundamentals course is a program that is taught in the first level of the Information Systems Engineering career. The objective of this course is: "To identify, design and correctly apply the basic aspects of the Object Oriented Programming paradigm in the implementation of computer solutions to problems, providing spaces for the student to form an investigative, reflect and self-taught attitude, as well as skills for collaborative work".

The course is developed in a face-to-face way, for a period of 17 weeks, two 2 days per week with 2 hours of daily lessons and 6 hours of independent study.

The course topics focus on four major topics:

- Introduction to Object Oriented Programming.
- Sequential Structures
- Repetitive Structures
- Uni and Bidimensional Arrangements

In order to apply the use of the Kahoot! tool, a group of 28 students worked on Computer Fundamentals.

The Kahoot! tool, allows to make questionnaires which are projects on a board and students through their mobile devices are connected to the game and can be answering each question synchronized with their peers. For each question, the tool assigns a score to each student according to whether the answer they have given is correct and, in the time, they have given it. In Figure 1, a picture of the question asked about conditional structures is presented. This figure 1 shows the teacher's test view with four answer options and on the right-hand side the mobile device is shown where the student has the four answer options and the student can mark it directly. If the student gets the answer right a message will appear on their phone and if not, a message will appear that they have made a mistake. In addition, each teacher can provide feedback on the answer once the students have completed their selection. This feedback is important because it allows the teacher to explain the logic used in solving the algorithm, allowing them to reason why that answer is correct. In addition, the teacher can explain repeatedly to the students until they can conclude that this is the best answer

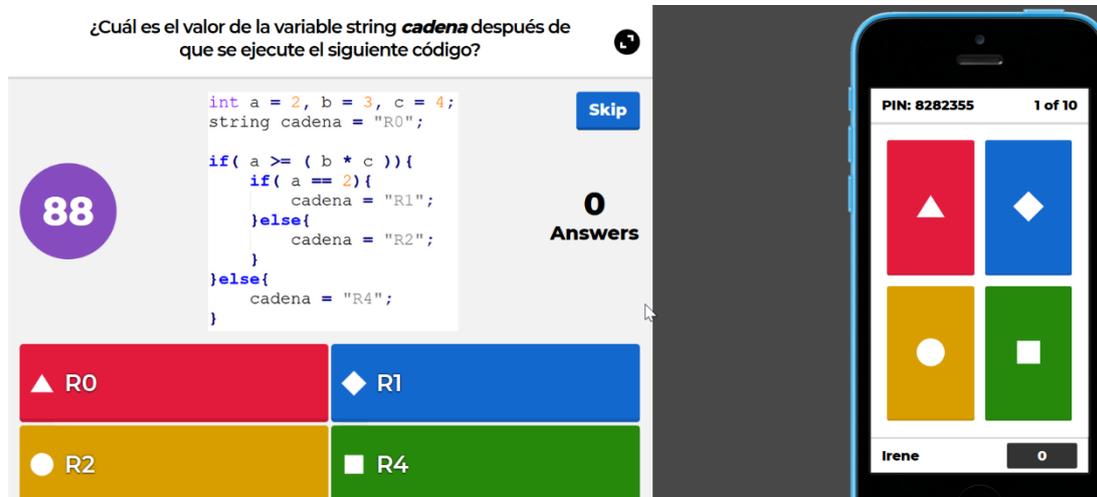


Figure 1. Example of the use of Kahoot! Source: Own elaboration

For the course 4 questionnaires were made for each of the topics of the course which were explained above. Figure 2 shows the view of the different questionnaires.

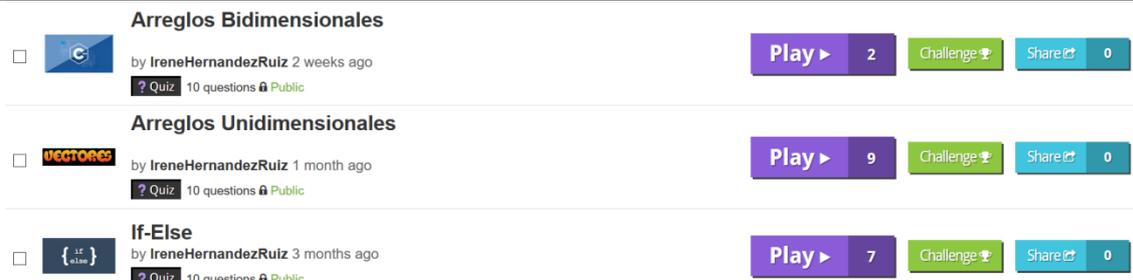


Figure 2. View of the different questionnaires that can be taken. Source: Own elaboration

Each quiz stores the students answers which can be consulted by the teacher and analyzed which students did not manage to solve it completely and revisit that topic in the next lesson.

The view enabled by this application is simple and allows the teacher to incorporate images of single choice cases. In figure 3, the geometric figures option is displayed to select the correct answer. Therefore, a straightforward interface is presented.

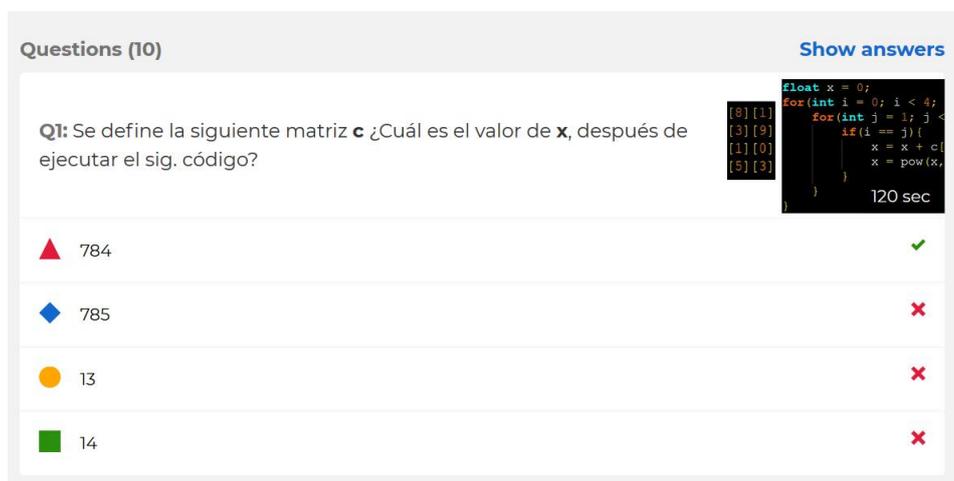


Figure 3. Question in the programming area. Source: Own elaboration

This application allows you to configure the time of the application and to manage the questions of the questionnaire. In figure 4, you are presented with the options for the general handling of the questionnaire.

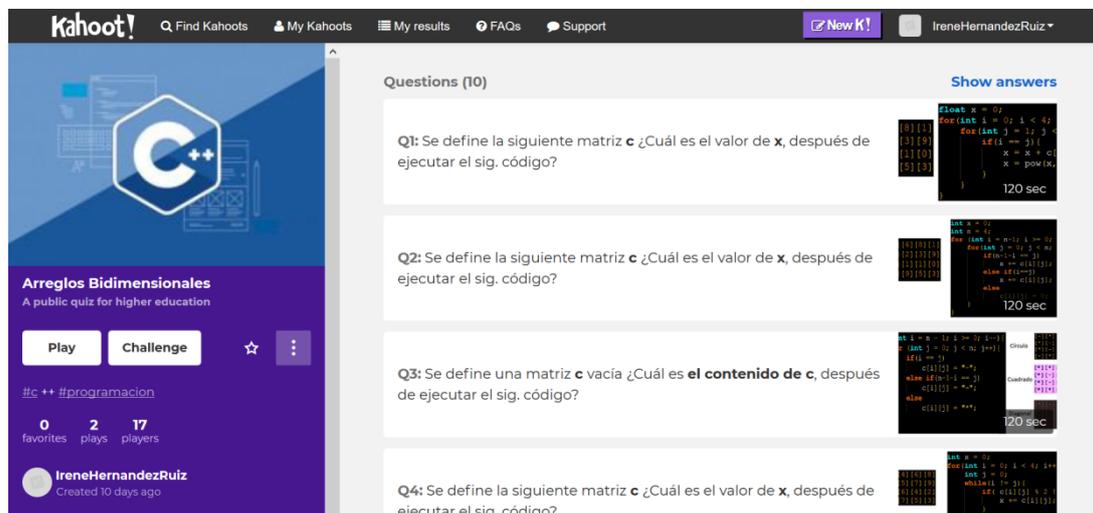


Figure 4. View of the questions that can be asked at Kahoot, Source: Own elaboration

On the other hand, in Figure 6, you can see the number of rounds played in the application and the number of players (students) who have participated.

In addition, it is possible to download the results of the rounds that have been worked on with the students and play the same questionnaire several times.



Figure 6. Options for downloading the questionnaire. Source: Own elaboration

On the other hand, the tool allows us to know the score obtained for each of the task and we can give more attention to the students who obtained a low result with the analysis of the problems as shown in figure 7.

Arreglos Bidimensionales				
Final Scores				
Rank	Players	Total Score (points)	Correct Answers	Incorrect Answers
1	Fran	4689	6	3
2	AarónG	3935	6	3
3	Andrei	3784	5	5
4	Lil Óscar	3338	4	6
5	LuisE	3182	4	6
6	Erick	2001	3	2
7	Jason M	1951	3	6
8	Wen	1865	3	6

Figure 7. Monitoring of students. Source: Own elaboration

### 3. Student perception questionnaire and main results.

To measure whether the tool was useful for the students, it was decided to make a basic tool in Google Forms, applied only to students who passed the course (28 students, of which 22 are men and 6 are women). And in a questionnaire, they were asked if they considered that the tool helped them to understand the topics of the class.

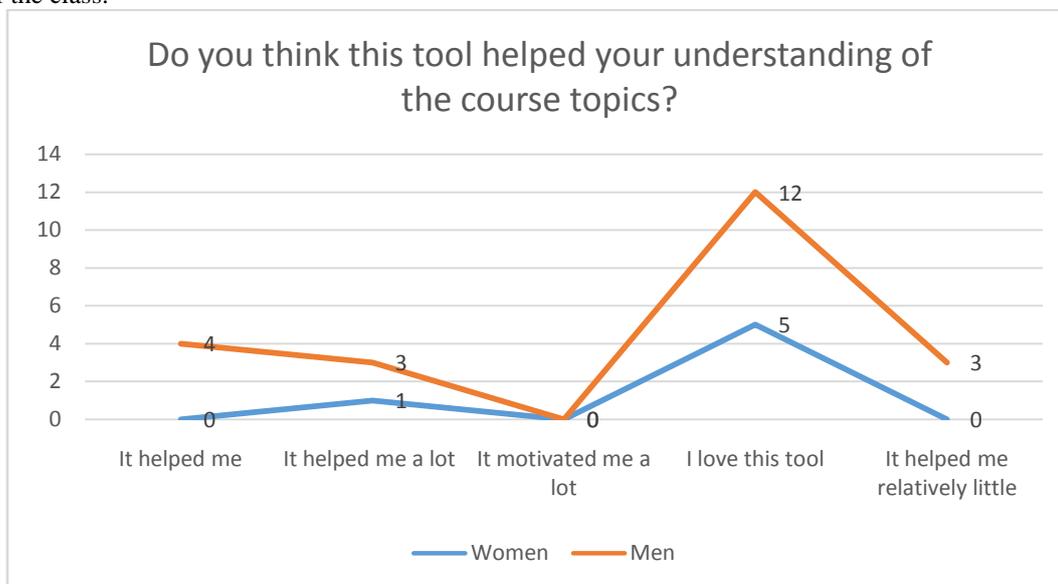


Figure 1. Understanding the topic. Source: Own elaboration

In figure 1, you can see the information of the female students in blue and the opinion of the male students, so you can see that most of the women responded that they love the tool as much as the male students.

With the data obtained, only two students considered that this tool helped them only a little.

#### **4. Conclusions**

Among the main recommendations that students would make to the dynamics of Kahoot! are that it would be good to repeat the experiment once the doubts of the exercises have been clarified, to create a programming competence and to analyze the possibility of carrying out exercises with a percentage value in the grades.

The use of the tool to know the progress of the students in the course, is very useful for the teacher because in a few steps the teacher can observe the answers that the students have entered and can make decisions to go back to a topic or to be able to do other activities to reinforce the topics.

Having these activities during the classes generates in the students a feeling of self-reflection to know if they have been able to study these subjects or if it is a moment to ask the teacher for help in explaining a topic.

On the other hand, this tool generates a competition for the students in which they, participate in these activities simultaneously, can see the behaviors of their peers and the way they solve problems with their students.

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