

Effect of using the Kahoot platform as a learning system in computer science before taking a final assessment

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Abstract

In the present research the degree of motivation is evaluated in four assessments using Kahoot, which will not have a grade in the grade of each student, which is intended to measure the level of motivation of an assessment when it is graded or not graded. In addition to the level of motivation, the level of learning is also measured by means of a fifth evaluation that will have a grade in the final grade. So a quantitative study is carried out where the level of improvement is measured in the score equal to or less than 20%, as the evaluations are carried out and less than or equal to 15%, when comparing the evaluations without value with the evaluation that does have a value in the qualification.

Keywords: Assessment, Motivation, Kahoot, teaching, learning.

I. INTRODUCTION

The Kahoot platform is free and allows to create assessment quizzes where students become a player who compete with each other, to answer correctly and in the shortest possible time [1], the main feature is to reinforce the knowledge acquired by students. The way of learning is mainly based on mobile devices, where through a Pin, students can enter the platform to play, while they know their score and who are with the highest score. Finally, the teacher can obtain concrete statistics of the participation of each student, to later correct the topics where more weaknesses were observed. Although the game is designed by the teacher, the students are the real protagonists [2].

Kahoot is successfully applied in the learning of vocabularies to learn different languages and it measures in addition to learning another factor such as motivation, which can be increased by using games, making it a didactic and more fun way to learn [3]. It is noteworthy that each teacher must have a methodology or steps before applying an evaluation with Kahoot, which allows an effective strategy to obtain the greatest achievements in language learning [4], must have appropriate instruments that measure the level of efficiency which can be qualitative or quantitative in such a way that allows the level of increase in the evaluation, in order to know if the technological aids increase the level of performance and motivation of students [5]. Being an online tool allows it to be applied more accurately in distance education, because multiple choice, true or false, self-completion, etc. tests can be

applied. Most researches show a great usefulness of Kahoot due to the increase in the final grade of each evaluation [6], [7].

Analyzing Kahoot as a tool that motivates teaching/learning, studies show that the use of games is an effective way to increase interest in the topics developed in class [8], but the question arises as to what can happen after years of using Kahoot, if the motivation will continue or to what extent the use of points and rewards based on the game can be dangerous. Will universities ask every teacher to design and develop assessments using this platform? All these aspects that are negative are also very important to carry out a good game and thus not end up in the monotony of the classes that were made before applying the Kahoot. It can be said that although it is motivating, it would be more convenient to use inverted classes to change the traditional teacher - student class and convert it into student - teacher, where students develop their knowledge, then play and then give feedback and, at the end, they leave doubts in the topics that they have struggled to understand [9].

One of the advantages of Kahoot is that it increases participation during classes, as it allows the whole group of students to respond, providing immediate feedback between teacher and student [10], and it can be used in any subject to strengthen concentration levels. The teacher can apply Kahoot at the beginning of a class, at the end or leave it to develop it as an asynchronous task, however the best way is to apply it online at the beginning or at the end to find adequate feedback [11]. Kahoot has proven to be a tool where the student does not feel pressured to respond and if very motivated to perform the evaluation by competing among all students [12].

This research focuses on the study of analyzing the Kahoot platform for a computer course, where they must submit a partial assessment, however the analysis is focused on performing four Kahoot prior to this assessment, which will not have a grade note, which means that they will have no value, so you can measure the student's motivation with the platform or if they are finally motivated when going to perform the assessment that has a rating as such.

II. METHODOLOGY

The subjects of a higher education career in Colombia are generally evaluated by 3 midterms and a final exam. At the beginning the first partial is determined by dates that the

university provides for its presentation and, it is very common that some students leave to study a few days before taking this test. That is why the methodology focuses on the first midterm, making 4 evaluations, playing on who is reviewing or studying as the topics are seen. These evaluations are not graded though, but the score is evaluated to analyze the motivation and finally the preparation for the first midterm.

The 4 evaluations begin with topics in computer informatics, binary arithmetic, program design and coding in programming. The first test is given unannounced to the student who faces a surprise game, with which you can measure the attention, motivation and preparation of the topics seen. Subsequently the student is already prepared for the rest of the tests and finally for the test of the first partial, in which if it has a qualification for the subject.

The sample consisted of 21 students. When taking the online test, the student who was not present was eliminated from the score, affecting their final score. In order to know their score, the response and the final time were evaluated.

The tests are based on 10 questions where they must perform different exercises according to the topic for their possible answer on the platform.

At the end the tests are compared with the test of the first partial, averaging the evaluations as shown in equation 1, and comparing with the first partial (P1).

$$EP = \frac{(E1 + E2 + E3 + E4)}{4} \quad (1)$$

Where:

EP: Average score.

E1: Computing informatics.

E2: Binary arithmetic.

E3: Design.

E4: Coding.

According to the above, they are classified into 4 results of motivation, where the percentages of increase or decrease between the variable E1 and E2 are compared (Equation 2).

$$M1 = \frac{(100 * E1)}{E2} \quad (2)$$

And we also compare the variables EP with P1, to measure motivation from the beginning to the end of the test (Equation 3).

$$M2 = \frac{(100 * EP)}{P1} \quad (3)$$

Where:

M1: motivation test E1 and E2.

M2: Motivation EP and P1 test.

In table 1 and 2, you can review the levels of motivation.

Table 1. Motivation percentages M1.

Percentage	Motivation
<20	Download
>=20 y <40	Acceptable
>=40 y <80	Very Acceptable
>80	Excellent

Table 2. Percentages of M2 motivation.

Percentage	Motivation
<0	Unimproving
>=0 y <15	Not significant
>=15	Significant

III. RESULTS

The E1 and E2 evaluation is analyzed, so that it is possible to know if after the first evaluation there was a real motivation, based on the score. The higher score the motivation because of the focus on learning the topics. In table 3, it can be seen that the last students still have an increasing level better than that of their peers, but the case of the student with code 20 is interesting because he then occupies the first place in the second evaluation and surpasses 19 of his peers to place first.

Table 3. Evaluation score E1 and E2 - Position.

Student Code	Total Score (points)	Student Code	Total Score (points)
1	6676	20	9351,00
2	6402	14	9137,00
3	5388	12	9113,00
4	5296	16	8229,00
5	5240	6	8045,00
6	5048	8	7483,00
7	4896	2	7084,00
8	4416	10	6961,00
9	4256	4	6853,00
10	4232	1	6352,00
11	4126	15	6119,00
12	3612	13	6015,00
13	3276	7	5649,00
14	2866	17	5134,00
15	2850	11	4790,00
16	2266	18	4777,00
17	1842	19	4324,00

18	1762	9	3868,00
19	1324	3	3857,00
20	0	5	3808,00
21	0	21	3781,00
22	0	22	2501,00

When looking at the trend in the score it can be concluded that all students have prepared and are interested in the E2 assessment, without it being a grade that will affect the final assessment of the first partial (Figure 1). The reason is based on the fact that they want to play and compete in order not to be exposed in front of the group.

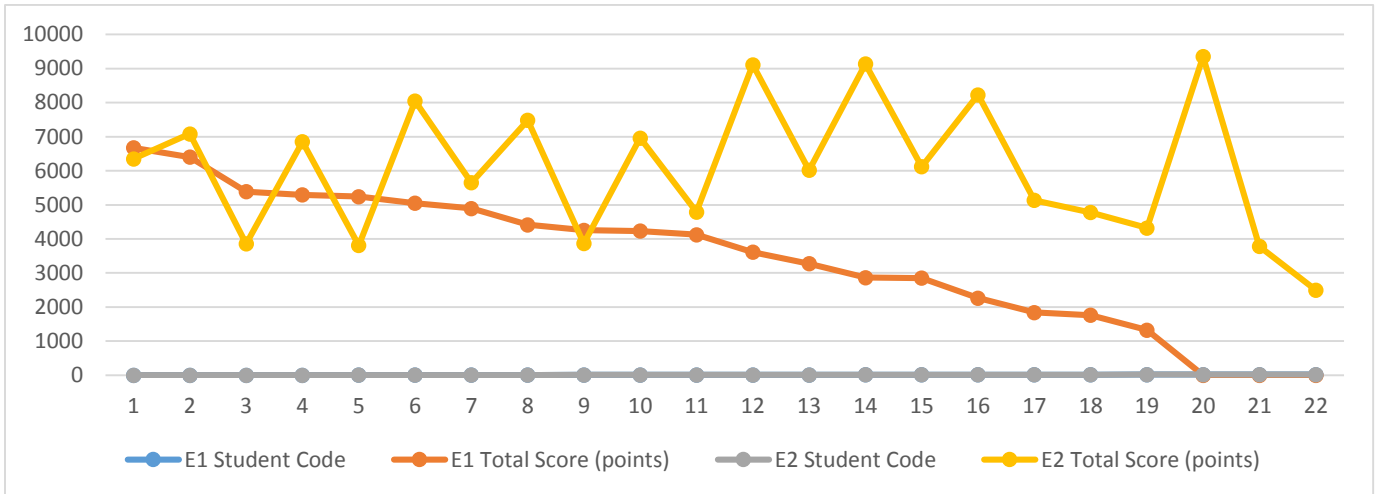


Fig. 1. Score trend between E1 and E2.

When analyzing the percentages of motivation between assessments E1 and E2 we found that 68.18 of the students have been motivated for the second assessment, where most of them have increased their score by more than 80% (Table 4).

Table 4. Percentage of motivation M1.

Student code	M1 (%)	Motivation
1	-4,85	Download
2	10,65	Download
3	-28,41	Download
4	29,40	Acceptable
5	-27,33	Download
6	59,37	Very acceptable
7	15,38	Download
8	69,45	Very acceptable
9	-9,12	Download
10	64,48	Very acceptable
11	16,09	Download
12	152,30	Excellent

13	83,61	Excellent
14	218,81	Excellent
15	114,70	Excellent
16	263,15	Excellent
17	178,72	Excellent
18	171,11	Excellent
19	226,59	Excellent
20	100,00	Excellent
21	100,00	Excellent
22	100,00	Excellent

When reviewing the evaluations of E2 and E3 it can be seen that the students who started the E1 test now occupy the first positions and the last student occupies a sixth position, which demonstrates the commitment with their learning, and the motivation that the game through Kahoot gives, the students who started the E1 test maintain acceptable levels but are surpassed at the moment of competing in the E2 and E3 tests, possibly they have felt comfortable by the results of E1, without realizing that now they have much lower averages for the group (Table 5).

Table 5. Evaluation score E2 and E3 - Position.

Student Code	Total Score (points)	Student Code	Total Score (points)
20	9351,00	16	9940,00
14	9137,00	20	9613,00
12	9113,00	12	9515,00
16	8229,00	8	9412,00
6	8045,00	1	9333,00
8	7483,00	22	9089,00
2	7084,00	7	8609,00
10	6961,00	18	8540,00
4	6853,00	19	8371,00
1	6352,00	6	8155,00
15	6119,00	14	8119,00
13	6015,00	5	8102,00

7	5649,00	13	7791,00
17	5134,00	3	7627,00
11	4790,00	11	7292,00
18	4777,00	2	6988,00
19	4324,00	15	6439,00
9	3868,00	10	6033,00
3	3857,00	9	4950,00
5	3808,00	17	4593,00
21	3781,00	4	0,00
22	2501,00	21	0,00

In figure 2 it can be determined that for evaluation E3 the student with code 1 has again improved his level and the tendency continues to rise, this shows that learning has been strengthened as the tests progress and, null results are shown due to the non-attendance of 2 students, which affect the general average of the group.

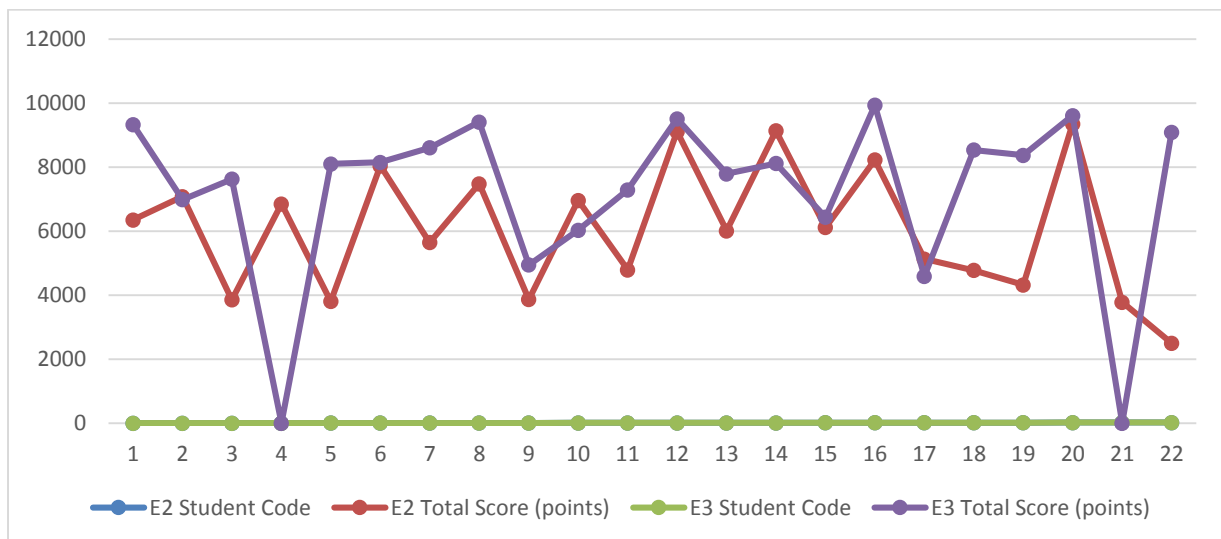


Fig. 2. Score trend between E2 and E3.

Table 6. Evaluation score E3 and E4 - Position.

Student Code	Total Score (points)	Student Code	Total Score (points)
16	9940,00	12	9409,00
20	9613,00	8	9138,00
12	9515,00	14	9126,00
8	9412,00	20	9046,00
1	9333,00	7	7816,00

Assessments E3 and E4 continue to keep students in the top 5 who were in the top 25% of performance and the top three students in E1 are close, showing motivation among the lowest scoring students at the start of the game in E1 (Table 6).

22	9089,00	22	7583,00
7	8609,00	16	7104,00
18	8540,00	2	7008,00
19	8371,00	3	6460,00
6	8155,00	1	6442,00
14	8119,00	6	6397,00
5	8102,00	17	6254,00
13	7791,00	18	6215,00
3	7627,00	21	6082,00
11	7292,00	13	6004,00
2	6988,00	15	5558,00

15	6439,00	11	4677,00
10	6033,00	10	4586,00
9	4950,00	9	4509,00
17	4593,00	5	3645,00
4	0,00	19	2591,00
21	0,00	4	0,00

In the E3 and E4 assessments, a drop in their scores has been observed, but with markedly sustained scores in both tests, maintaining high levels of learning (Figure 3).

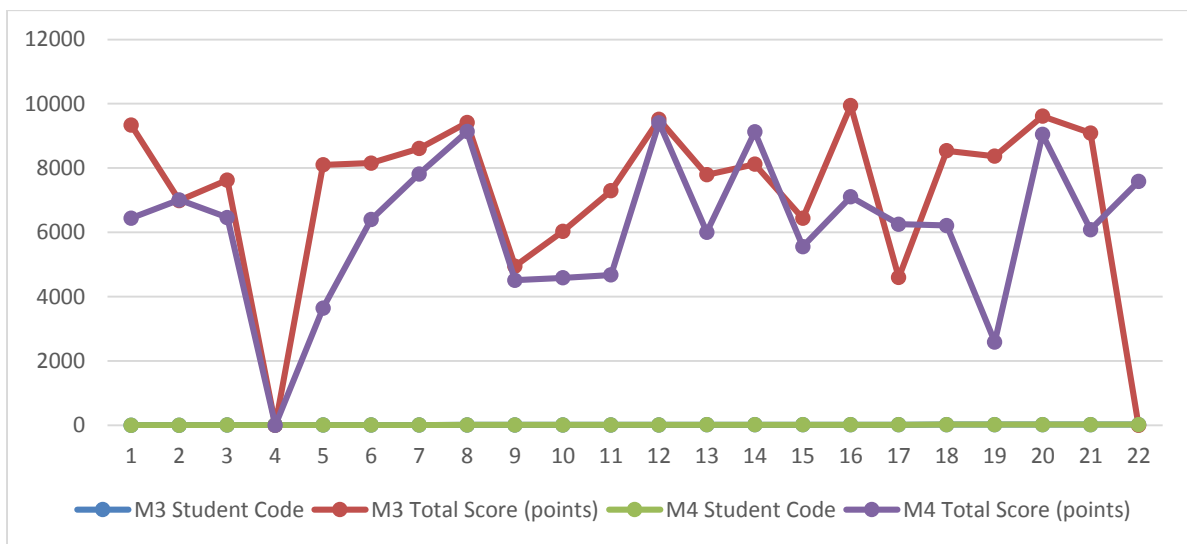


Fig. 3. Score trend between E3 and E4.

To measure the motivation of M2, the evaluations E1 to E4 were averaged and compared with the final evaluation test of the first partial P1. Upon review, it can be determined that there is an increase in the score when taking the P1 test, which leads to the conclusion that motivation makes the final score and grade always end up increasing in most cases, since it prepares them for the evaluation of the first midterm (Table 7).

Table 7. Percentage of M2 motivation.

Average E1, E2, E3 and E4		P1	
1	7200,75	1	8609
2	6870,5	2	6975
3	5833	3	6787
4	3037,25	4	0

5	5198,75	5	8938
6	6911,25	6	8994
7	6742,5	7	6404
8	7612,25	8	8625
9	4395,75	9	8415
10	5453	10	7017
11	5221,25	11	8825
12	7912,25	12	8247
13	5771,5	13	0
14	7312	14	8451
15	5241,5	15	8957
16	6884,75	16	7246
17	4455,75	17	8582
18	5323,5	18	9672

19	4152,5	19	9039
20	7002,5	20	8285
21	2465,75	21	7387
22	4793,25	22	8588

When analyzing Figure 4, it can be determined that there is an increase in the number of students who had started the learning topics poorly, and that students with good scores feel less motivated by having to compete, although they keep the high scores the same as when they started with the E1 assessment.

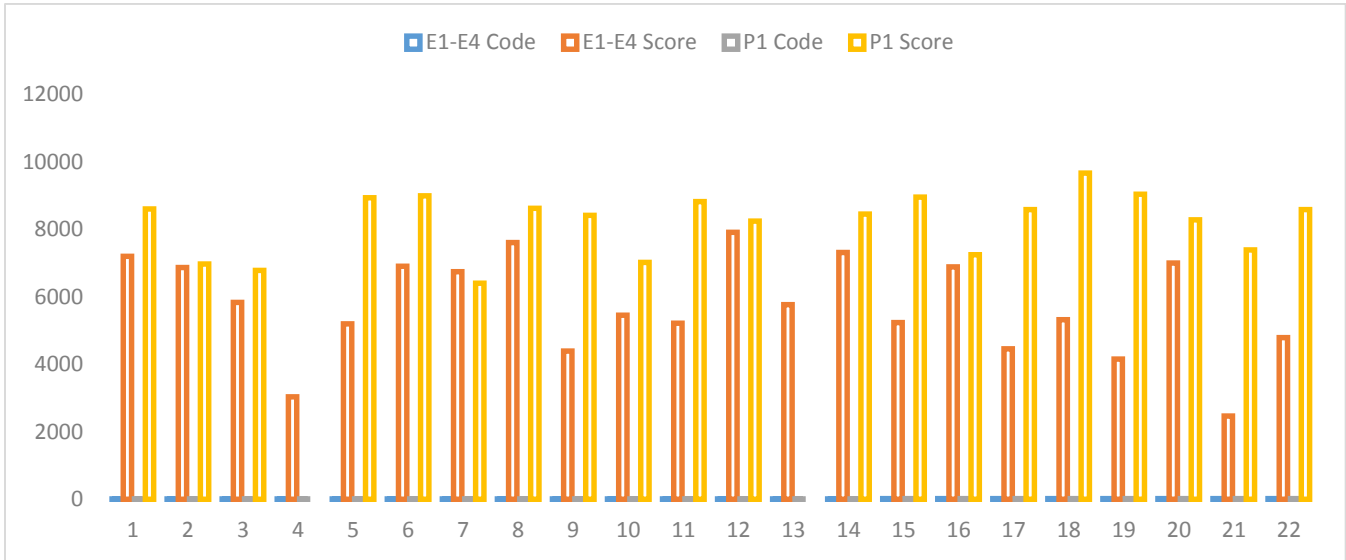


Fig. 4. M2 score trend.

When analyzing table 8, it can be concluded that 68.18% of students have increased the score with respect to the 4 evaluations, therefore by means of Kahoot maintains the motivation and concentration in the topics that are being explained with an increase of more than 15 to 199.58 percent in some students, while 18.18% of the students maintained their motivation the same as at the beginning of the evaluations and 13.63% of the students had a decrease in their score. Finally, 86.37% have successfully completed the tests.

Table 8. Percentage of M2 motivation.

Code	M2	Motivation
1	19,56	Significant
2	1,52	Not significant
3	16,36	Significant
4	-100,00	Unimproving
5	71,93	Significant
6	30,14	Significant
7	-5,02	Unimproving
8	13,30	Not significant

9	91,43	Significant
10	28,68	Significant
11	69,02	Significant
12	4,23	Not significant
13	-100,00	Unimproving
14	15,58	Significant
15	70,89	Significant
16	5,25	Not significant
17	92,61	Significant
18	81,68	Significant
19	117,68	Significant
20	18,31	Significant
21	199,58	Significant
22	79,17	Significant

Part of the motivation is seen in the students who at the beginning occupied positions 18 and 19 and now occupy positions 1 and 2, so it may be that they handle the topics well from the beginning and their motivation was not adequate, not having a commitment or challenge that keeps them motivated. It is important to conclude that it is important to carry out a

constant evaluation of the students so that the learning can be fixed and analyzed for the benefit of each one.

IV. CONCLUSION

The results show that the Kahoot platform and the different forms of evaluation offer a degree of motivation in continuous improvement, even if the evaluations do not have a grade. The degree of motivation is mainly due to the fact that the student has a desire to compete and be at the top, as a way of learning and to stand out in the group. If we analyzed the ungraded assessments and the graded assessment, we can deduce that the students are prepared at any time for the real assessment, which can be summarized as a result of a high level of motivation regardless of the real or ungraded assessment.

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