


Article

Investigating Students' Perception of Online Assessment as a Result of the Interaction among the Extrinsic Assessment Factors on Students Psychological Characteristics

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Abstract: Since April 2020 all schools and universities have been running online classes on e-learning platforms and teachers have gradually integrated various educational software into the teaching-learning process. Our target group consists of 114 students of the faculty and college. We wanted to find out their opinions about the geography online assessment, identifying the factors that influenced this process and any differences that occurred between the two categories of subjects. The results of the study showed that students at technical college adapted very well to online evaluation and the numerous chi-square associations with technological factors show the importance students attached to them over pedagogical and social factors. Students felt the need for digitisation of the learning process as most of the associations are between psychological learning factors and technological ones. The university students, unlike students from college, did not respond under the impact of emotions, and appreciated the software design of Kahoot and Google Forms by associating a positive, stimulating connotation with psychological features (motivation, memory, comprehension, relaxation). We conclude that both technical college and university students appreciated the benefits of online assessment through the use of Kahoot and Google Forms tools on both psychological and pedagogical levels.

Keywords: online evaluation; Google Forms; Kahoot; motivation; memory; understanding



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1. Introduction

Prior to March 2020, e-learning as a form of education was implemented at national level only in universities, as a form of distance learning. Romanian universities developed their own e-learning platforms providing a remote teaching-learning-assessment as a result of the increasing demand of the employed population for formal education and further education. Thus, in 2011, the Chamber of Deputies completed the National Education Law no. 1/2011 with articles on distance learning through e-learning platforms [1]. In that period (2011–2020), we can appreciate that some experience on e-learning and online learning was gained at the university level. However, the pandemic brought a variety of challenges to our society, affecting education directly. Unlike universities which already had some experience of e-learning, secondary schools and high schools were taken completely by surprise. The Ministry of Education had to adapt its methodology at once, regulating e-learning in pre-university education in April by publishing OMEC no. 4135/21 April 2020 [2], which is a legislative novelty. Since April 2020 all schools and universities have been running online classes on e-learning platforms and teachers have gradually integrated various educational software into the teaching-learning process. They started using applications that they had not used before the pandemic.

In the 2020–2021 school year, all educational institutions organised online courses. We are now witnessing a general expansion of e-learning to all categories of students. The online environment is still influenced by psychological, pedagogical, socio-cultural, technological, etc. factors. Each student has their own psychological peculiarities, personal skills, cognitive style, and cognitive characteristics [3] and will therefore react differently in the new pandemic context. Internal psychological factors of learning such as motivation, memory, comprehension, and relaxation, have interacted with a number of external factors. Learning motivation is defined as the overall set of motivations that enhance the intensity of effort in learning [4]. Zimmerman (1990) [5] considers that motivation is a phenomenon in a permanent dynamic in which the learner's perceptions and behaviours interact with the environment. In stimulating motivation, whether intrinsic or extrinsic, a combination of factors contribute, including technological factors. Accordingly, studies on the impact of digital technologies in language classrooms have found that they can generate intrinsic motivation, as learners feel increased interest and engagement in learning tasks [6] in relation to topic areas that might not normally be motivating [6]. Some digital applications have already proven their effectiveness in stimulating motivation, such as Kahoot, as its friendly design motivates students [7,8] and Google Forms with its friendly interface acts like a stimulus upon the students' need to compete with each other [9]. Competition increases motivation and prepares students for exams [10] if you like being evaluated online.

However, what students do learn in school in the form of information acquisition, skills, and attitudes is retained later on through memory [11]. Memory is one of the mental processes underlying the school learning process, which through its forms of manifestation, influences the results [12]. Some studies have highlighted the role of memory in: (1) academic performance, especially in reading comprehension and problem solving [13–16]; (2) mathematics; and (3) the organisation of memorized information through a process of analysis, sorting, classification, transfer and application to new conditions [17]. Students can memorise easily when they are motivated [18] and if they understand the information they have to learn. The use of digital applications can stimulate a student's visual memory if they have a visual learning style [19]. During a learning sequence, comprehension may also occur [18].

Comprehension is a process of thinking that consists in observing the existence of a link between the set of new knowledge and the set of old knowledge already elaborated [20,21]. It also implies establishing correlations or links between knowledge. White argues that understanding 'is applied to a range of different targets with 6 scales: concepts, whole disciplines, single elements of knowledge, extensive communications, situations, and people' [22]. At the same time, the educational process must give the opportunities to students to gain personal understanding of concepts [23]. Relaxation also becomes a necessary condition for creating a harmonious learning climate in the classroom in order to reduce stress. It becomes of utmost importance as scientific studies have shown that stress has a negative impact on: (1) learning and memory [24,25]; and (2) the learner's psyche in stressful situations, the memory resources being consumed by intrusive worries about failure [26].

Another set of factors are the pedagogical ones created with teaching strategies, methods, and means used by the teacher. We should also take into account the communication skills and personality of the teacher, aspects that in online learning have favoured the focus on student-centred teaching. Socio-cultural factors have also acquired another importance on e-learning platforms. However, the most important impact has been the technological factors, as the courses have taken place on e-learning platforms and educational applications. Teachers use educational software either to capture students' attention by making online lessons more dynamic, or to develop abilities and assess the knowledge learnt by students.

From the multitude of existing applications, we chose to use Kahoot and Google Forms for student assessment because of the benefits they offer. We used Kahoot because of the purpose for which it was created as a game-based student response system (GSRS) [27]

such as an increase in student motivation, engagement, and concentration, improved performance, and energised classrooms [28] to provide an environment that promotes competitiveness and learning [27]. Another advantage of Kahoot software is that through the game students participate not only to tests and discussions, but also to surveys [29,30]. It gives them autonomy because students use their own devices [31]. Nevertheless, some studies have identified a number of disadvantages such as: the lack of IT and technological skills, internet connection, and devices may create a feeling of intimidation for certain students [32], and the impossibility of going back to answers given once the game has been submitted [28] does not develop students' vocabulary [33].

Google Forms is an integrated web-based application that has proven to be a useful tool in providing real-time formative feedback [34] that allows teachers to adapt their content to possible problems arising in the teaching-learning process. Some studies have highlighted a number of benefits of Google Forms: it helps students to develop metacognitive knowledge [34]; it helps the teacher to know the cognitive profile of the student [34]; the data is stored in the drive in an organised fashion [35], which can be exported as Excel sheets; and it also allows for the sending of confirmation notifications, meaning the time resource is no longer distributed per question, as in Kahoot, but at the level of the entire test. For the educational institutions which use the Google Classroom platform for online learning, the use of Google Forms has been very convenient as they are an integral part of it. Thus, students and teachers do not have to rely on external platforms.

The current study aims to analyse how students have adapted to online assessment regarding Geography. We used two applications, Kahoot and Google Forms, when we assessed online.

The research questions:

1. What are the main factors that influenced the perception of students while using Google Forms and Kahoot applications in Geography online assessment?
2. How do the perceptions of the two categories of subjects—technical college students and university students—vary towards the online assessment and the applications used?

2. Materials and Methods

2.1. Data

The target group consists of 57 students of the Faculty of Geography of the University and 57 students in their final year at the Technical College. The 114 students were assessed online between March and April 2021 using Google Forms and Kahoot applications on content previously taught through Google Classroom and Cisco Webex platforms, as the pandemic imposed the use of online learning methods.

2.2. Methods

2.2.1. Questionnaire

After the students were assessed online, they received a questionnaire. We wanted to find out their opinions about the online assessment, identifying the factors that influenced this process and any differences that occurred between the two categories of subjects. Both the questions and the answers to the questionnaire included keywords representing factors of either internal or external nature. Thus, the first 4 questions introduced variables such as: learning motivation, relaxation/stress relief, memory facilitation, and comprehension ease. Questions 5 and 6 were associated with social and pedagogical factors whereas questions 7–13 were mainly focused on technological aspects.

The questionnaire was structured in two categories of questions that focused on:

- the psychological benefits of the software used in online assessment (learning motivation, relaxation/stress relief, ease of remembering, ease of understanding);
- the main factors in predicting students' perceptions such as technological factors (use of the internet, Google Forms, and Kahoot with their features), social factors (enjoy

the competition, not boring/it's fun), and pedagogical factors (time, details, difficulty of the questions, not enough time to read and understand, chosen time).

2.2.2. Educational Software

The applications used in student assessment Kahoot and Google Forms are also research methods. Kahoot is one of the most popular game-based learning platforms being used by a large number of teachers and students [36]. In 2019, it was used in over 200 countries [37]. As a method of student assessment, the digital game Kahoot is quite effective because the results serve as diagnostic and formative assessment [30]. Additionally, users have the possibility to access Kahoot materials posted by other peers [38]. Thus, they practically become open access resources for the community of teachers and students, contributing to the formation of a sense of community [27]. Google Forms in the version of Google Suite for Education (G-Suite for Education) is a complex application that allows the management of materials, evaluation, and analysis of results [39]. In technical terms, it is very advantageous because it offers unlimited storage space, a high level of security, and easy login [39].

2.2.3. Statistical Analysis

The data obtained from the questionnaires were statistically analysed using SPSS 28.00. Given that our statistical data are dichotomous [40], the existence of relationships between variables can be checked by the chi-square association coefficient. Chi-square test of independence is a tool applicable to nonparametric tests [40]. The syntax of SPSS 28.00 software was Analyse-Descriptive Statistics-Cross-tab, and the dependent values were arranged in columns, motivation, relaxation, ease of understanding, and ease of remembering, and the independent values in rows are classical methods. Do you like being evaluated online? There is an immediate result. The sample allowed us to go up to a 90% confidence range.

3. Results

Hypothesis 1: *The variables of interest are associated with student perceptions about online evaluation while the association of intrinsic psychological factors is affected by extrinsic external factors (technological, pedagogical, social). The target group of students from technical college recorded 20 statistically significant associations according to the chi-square coefficient (Table 1a).*

Table 1. (a) The results of chi-square test with statistical significance for target group made by students from college. (b) The results of chi-square test with statistical significance for target group made by students from faculty. * indicate the association between the variables.

Crosstab/Variables	Pearson Chi-Square Test		
	Value	df	Asympt. Signific. (2-sided)
(a)			
Ease of remembering * Dislike Google Forms interface	5047	1	0.025
Ease of remembering * Dislike Google Forms lack of animations	8499	1	0.004
Ease of remembering * Dislike Google Forms to hard to use	3298	1	0.069
Ease of remembering * Dislike Kahoot lack of animations	3846	1	0.050
Ease of remembering * Dislike Kahoot to hard to use	3068	1	0.080
Ease of remembering * You Like Being Evaluated Online	10,668	1	0.001
Ease of understanding * Dislike Google Forms interface	3871	1	0.049
Ease of understanding * Dislike Google Forms lack of animations	6747	1	0.009
Ease of understanding * Dislike Google Forms to hard to use	2850	1	0.091
Ease of understanding * You Like Being Evaluated Online	4676	1	0.031
Motivation * Classical methods	4668	1	0.031
Motivation * Dislike Google Forms interface	2907	1	0.088
Motivation * Dislike Google Forms lack of animations	5291	1	0.021

Table 1. Cont.

Crosstab/Variables	Pearson Chi-Square Test		
	Value	df	Asympt. Signific. (2-sided)
Motivation * You Like Being Evaluated Online	7995	1	0.005
Motivation * Not boring/it's fun	6204	1	0.013
Relaxed * Classical methods	4854	1	0.028
Relaxed * Kahoot	6535	1	0.011
Relaxed * Immediate Result	3229	1	0.072
Relaxed * You Like Being Evaluated Online	14,244	1	0.000
Relaxed * Google Forms	6535	1	0.011
(b)			
Ease of remembering * Difficulty of question	5311	1	0.021
Ease of remembering * You Like Being Evaluated Online	4692	1	0.030
Ease of remembering * Google friendly interface	3341	1	0.068
Ease of remembering * Internet	3487	1	0.062
Ease of remembering * Kahoot easy to use	5179	1	0.023
Ease of remembering * Kahoot friendly interface	5179	1	0.023
Ease of remembering * Not enough time to read and understand the questions	3464	1	0.063
Ease of remembering * Time too short	10,242	1	0.001
Ease of understanding * Details	3964	1	0.046
Ease of understanding * Dislike Google Forms to hard to use	3964	1	0.046
Ease of understanding * Dislike Kahoot lack of animations	4035	1	0.045
Ease of understanding * You Like Being Evaluated Online	7533	1	0.006
Ease of understanding * Google Forms easy to use	16,295	1	0.000
Ease of understanding * Kahoot easy to use	3539	1	0.060
Ease of understanding * Kahoot friendly interface	3539	1	0.060
Ease of understanding * Time too short	4655	1	0.031
Ease of understanding * Google Forms friendly interface	20,075	1	0.000
Ease of understanding * Classical methods	8717	1	0.003
Motivation * Classical methods	8717	1	0.003
Motivation * Details	3964	1	0.046
Motivation * Dislike Google Forms interface	6474	1	0.011
Motivation * Dislike Google Forms to hard to use	3964	1	0.046
Motivation * You Like Being Evaluated Online	7533	1	0.006
Motivation * Kahoot easy to use	6407	1	0.011
Motivation * Time too short	7886	1	0.005
Motivation * Kahoot friendly interface	6407	1	0.011
Relaxed * Dislike Kahoot hard to use	3971	1	0.046
Relaxed * Kahoot easy to use	8740	1	0.003
Relaxed * Not boring/it's fun	4868	1	0.027
Relaxed * You Like Being Evaluated Online	8570	1	0.003
Relaxed * Kahoot friendly interface	8740	1	0.003

We notice that the greatest impact on students' psychological processes occurs due to technological factors [41], so the characteristics of the tools, such as the interface, the way of use, and animations, have an extrinsic impact on them. The ease of remembering has recorded 6 associations with: I don't like Google Forms interface, I don't like Google Forms it's too hard to use, I don't like Google Forms because it lacks animations, I don't like Kahoot it's hard to use, I don't like Kahoot because it lacks animations, and I like being evaluated online. The ease of understanding has 4 associations with all the characteristics that are related to I don't like Google Forms and I like being rated online. Motivation has 5 associations with I like being evaluated online, classical methods, I don't like the Google Forms interface, I don't like Google Forms because it lacks animations, and not bored/it's fun. Relaxation is associated with: Kahoot, Google Forms, classical methods, I like being evaluated online, and immediate result. The working hypothesis was validated by demonstrating the association between the variables analysed.

Hypothesis 2: *The variables of interest are associated with student perceptions about online evaluation, the association of intrinsic psychological factors is affected by extrinsic external factors (technological, pedagogical, social).*

Regarding the target group formed by the students of the Geography Faculty, we identified a larger number of associations, 31, according to the chi-square coefficient (Table 1b).

Ease of remembering has 8 associations (difficulty of the question, I like being evaluated online), Google Forms-friendly interface, on the internet, Kahoot easy to use, Kahoot-friendly interface, I don't have time to read and understand what is being asked, not enough time); ease of understanding has 10 associations (too many details, I don't like Google Forms it's too hard to use, I don't like Kahoot because it lacks animations, I like being rated online, Google Forms easy to use, I don't like Kahoot because it lacks animations, Kahoot-friendly interface, time too short, Google Forms-friendly interface, classical methods). Motivation records 8 significant associations (classical methods, too many details, I don't like Google Forms interface, I don't like Google Forms it's too hard to use, I don't like Kahoot because it lacks animations, Kahoot easy to use, time too short, Kahoot-friendly interface). The last dependent variable, relaxation, has 5 associations (Kahoot easy to use, I don't get bored/it's fun, I like being evaluated online).

Regarding students, the hypothesis was also validated by the chi-square coefficient values.

4. Discussion

4.1. Which Are the Main Factors That Influenced the Satisfaction of the Students on Using Google Forms and Kahoot Applications in the Online Geography Assessment?

With regard to the first research question, statistical analysis revealed a number of predictors that influenced students' perceptions of online assessment and the impact of the applications used on the mental processes of learning. According to the technical college students, the variable ease of remembering is mainly influenced by technological factors with a focus on what they do not like about Google Forms, including lack of animations and difficulty of use, as well as Kahoot, wherein difficulty of use and lack of animations were also reported. Perhaps the most important predictor, if we were to rank them, is the response given to, Do you like being evaluated online? Given that we used the binary coding system for responses, 0 (for absence) and 1 (for presence), we can explain the chi-square associations in terms of positive or negative connotations. Ease of remembering corresponds to the cognitive function of memory. The existence of these associations only with technological factors may suggest that the interviewed students have predominantly a visual memory and the lack of animations from Google Forms and Kahoot and the unfriendly interface of the apps do not stimulate all students' memory and do not provide them with a multisensory experience [42]. Ease of remembering interacts with thought operations, willpower, and affective-emotional processes [20], and the lack of animations in Google Forms and Kahoot does not facilitate the establishment of beneficial links to stimulating memory; 78.94% and 38.58% of subjects were dissatisfied with the lack of animations. The association of dependent variable ease of understanding with the independent variable I don't like Google Forms too difficult to use, can be interpreted as having a positive connotation because only 2 subjects considered this application difficult for them (3.50% of the subjects); hence, a percentage decrease in the independent variable is associated with an increase in the dependent ones.

The easier an application is to use, the greater the psychological benefits of learning, the students' comprehension, and memory capacity. As the proportion of students who do not like online assessment is low, the frequency of those interested in using digital tools increases, recognising their benefits on memory, understanding, and motivation. Ease of understanding is also influenced by what they do not like about Google Forms and how liking is to be assessed online. We observe that the two cognitive thought processes, memory and comprehension, are only associated with the design of the applications used in the assessment, which might suggest that students chose these predictors from an

emotional perspective, being driven more by their expectations of application design. The third variable, learning motivation, is very important for students in that it contributes to school success [20].

Consequently, these results show the impact of online/e-learning on education. Refs. [43–45] pointed out that students' motivation should be analysed not only from the perspective of the learning content, but also from the conditions in which learning takes place. In the case of online learning/e-learning, the conditions of learning have changed, students have moved out of the traditional face-to-face environment, and learning is more centred on them and not on the teacher. Further, in the case of motivation, predictors from the sphere of technological factors appear, namely the lack of animations, the unfriendly interface of Google Forms, and the preference to be assessed online. The percentage of students who do not like online assessment is only 10.52%, a relatively small value compared to the high percentage of those who do like online assessment at 89.48%. Unlike junior high school students, final year students spend little time interacting with classmates. Therefore, their group cohesion is very limited, their classes are divided into small groups of 2–3 people, and they are mostly spending time with friends outside the classroom or school. As they had more free time at their disposal and no more commuting time, they organised it according to their own preferences. Similarly, university students have a similar profile, especially Master's students who work throughout their studies to support themselves, thus reducing the interest in developing interpersonal relationships, knowledge, and communication in the university environment.

Therefore, all associations with the independent variable "you like being assessed online" have a positive connotation; as the percentage of those who do not like online assessment decreases, the value of the dependent variables increases, demonstrating an inversely proportional relationship. The chi-square test coefficient gives us a flexibility of interpretation, so 76.9% of those who like to be evaluated online justify the response of the 31 people who felt motivated. Another association with positive connotation of motivation is recorded between variables classical methods and I am not bored/it is fun. The association between motivation and classical methods could be determined by the long face-to-face learning experience that students have accumulated. Due to the fact that high school students had never experienced online learning before, that they were not used to e-learning platforms, or some of them did not even have the necessary digital skills, it could justify the association of motivation with classical methods. Chi-square test values show that 50% of those who stated that they did not like classical methods were associated with 77.4% of those who felt motivated by Google Forms and Kahoot. Social factors did not register too many significant associations. They appear only once between motivation and not boring/it's fun, which is totally justifiable given the online context. Relaxation also plays an important role in the learning process and implicitly in evaluation. There are associations between relaxation and technological factors (Google Forms, Kahoot, and you like to be assessed online), and only one with a pedagogical factor (immediate result). The associations between relaxation and Kahoot/Google Forms and you like being evaluated online had a positive account. The chi-square test value shows that the value of 94.2% of all those who felt relaxed was due to the 60% of subjects who said they liked being rated online.

Although the students assessed online lacked the experience of working on e-learning platforms and applications such as Kahoot and Google Forms because the teaching-learning process before the pandemic was not innovative, statistically significant associations were still recorded, which shows the students' openness to online learning [9] and their rapid adaptation to new challenges. The chi-square test showed that 59.6% of all those who stated that they prefer Kahoot were associated with the 40.4% of subjects who felt relaxed during the online assessment.

Face-to-face learning is based on traditional classroom tests consisting mainly of essay structure items and rarely subjective or objective items. Students' long waiting time between taking the test and its evaluation is a problem. Students had to wait 30 days for

some test results. This shortcoming led students to appreciate that these Google Forms and Kahoot applications reduce the waiting time and amount of stress. In a relatively short time the students developed the digital skills needed to adapt to the online environment. Insufficient facilities in educational institutions did not allow the formation of cross-curricular Geography and IT skills. Although the institution has two computer labs, they are used exclusively by ICT teachers, which is why geography classes were held without ICT. Almaiah et al. also mentioned that lack of e-learning system usage hampers the realisation of benefits [41,46].

Despite these shortcomings, the results of the study showed that students at Technical College adapted very well to online learning and the numerous associations with technological factors show the importance students attached to them over pedagogical and social factors. Students felt the need for digitisation of the learning process as most of the associations are between psychological learning factors and technological ones. We also appreciate the significance of the lack of correlation between dependent variables (motivation, relaxation, ease of remembering, ease of understanding) and pedagogical and social factors.

By the non-existence of chi-square correlations with these elements, we understand that the students coped with the pedagogical challenges of the assessment related to the time of the test, the difficulty of the questions, and the required details, reinforcing our observation that the students adapted to the new challenges by focusing more on the impact and benefits of the digital tools at the psychological level. The real challenge was therefore to increase and stimulate the intrinsic psychological factors of learning through the internet, Kahoot, and Google Forms applications.

Regarding the results recorded in the sample of Geography students at the University of Bucharest, 31 significant correlations were recorded. The chi-square coefficient values indicate associations between the ease of remembering and pedagogical and technological factors. The pedagogical factors that have a relevant impact are: time too short, difficulty of questions, and not enough time to read and understand the questions.

The university students, unlike students from technical college, who receive a compulsory education, are attending optional studies that they have chosen according to their own needs, aspirations, and personal expectations. Consequently, it was found that they pay attention to pedagogical factors. Ease of recall helps them to achieve better test results, ensures their success at the academic level, and from this point of view insufficient time allocated to assessment through Kahoot and Google Forms. On the other hand, the difficulty and details of the tests can have a negative impact on the individual's ability to achieve the expected performance. They are more interested in the outcome of online assessment through Kahoot and Google Forms. In students' perception, technological factors played the role of stimuli on the intrinsic psychological factors of learning, one conclusive example being Kahoot. The chi-square associations between a Kahoot-friendly interface, Kahoot being easy to use, and motivation, ease of remembering, ease of understanding and relaxation demonstrate that the pleasant interface and ease of use of Kahoot played a beneficial, stimulating role in all internal psychological factors.

Students who are not motivated are prone to fail in achieving their goals [47], which is not our case. The advantages that Kahoot offers to users are: the possibility of displaying the ranking with the final results and the scores obtained at class level after completing the test, detecting wrong answers and learning from their own mistakes, self-correction, and increasing the autonomy of students in the learning process by monitoring their own progress. These were, in the students' opinion, only some of the mechanisms able to avoid a decrease in the quality of learning and thus to help them avoid losing interest in online courses.

We also find associations with Google Forms-friendly interface and use of the internet for ease of remembering. Since the success of an e-learning system depends on students' willingness and acceptance to use this system [46,48,49], it explains the high number of chi-square associations. Ease of understanding also registers significant correlations with

pedagogical and technological factors. The pedagogical predictors are classical methods, details, time too short, and the technological predictors are Google Forms and Kahoot easy to use, Kahoot-friendly interface, etc. Learning motivation is one of the most studied variables [50], a force which gives direction to continue and choose a particular learning behaviour [51], and from this point of view is very important in the educational process. In our case, the students' motivation is influenced by Kahoot due to the interface design and ease of use. We find as a constant the variables time too short (a frequency of 47.36%) and details (a frequency of 5.26%), these being the only problems that could demotivate some of the students. The variable relaxation is associated with Kahoot and one social factor, I am not bored/it is fun.

Increasing some mental skills in students in the study of Geography can be provided by digital tools such as maps, pictures, and diagrams which can be included to develop a number of specific visual memory skills. According to Baddeley's model, memory plays a key role in problem solving through one of its three components, the visual-spatial sketchpad [52], and in Geography, more than ever, visual and spatial information are used. Maps, diagrams, and images are also means that help students to memorize knowledge more easily. The insertion of maps, diagrams, and images in Kahoot and Google Forms was done with the aim of students identifying relationships, pattern seeking, and ability to describe a phenomenon because in this way the students can store information in their long-term memory [3]. The association between ease of remembering with the internet and digital instruments explains the students' need for personal development in accordance with the current digital transition concerns. According to Henderson, Selwyn, and Aston (2015) [53] if we are paying attention to the digital needs of students using digital technology tools, we could improve students' memory and learning.

4.2. How Do the Perceptions of the Two Categories of Subjects—Technical College Students and University Students—Vary towards the Online Assessment and the Applications Used?

Although the two categories of participants have different profiles, the study revealed both differences and similarities (Figures 1 and 2).

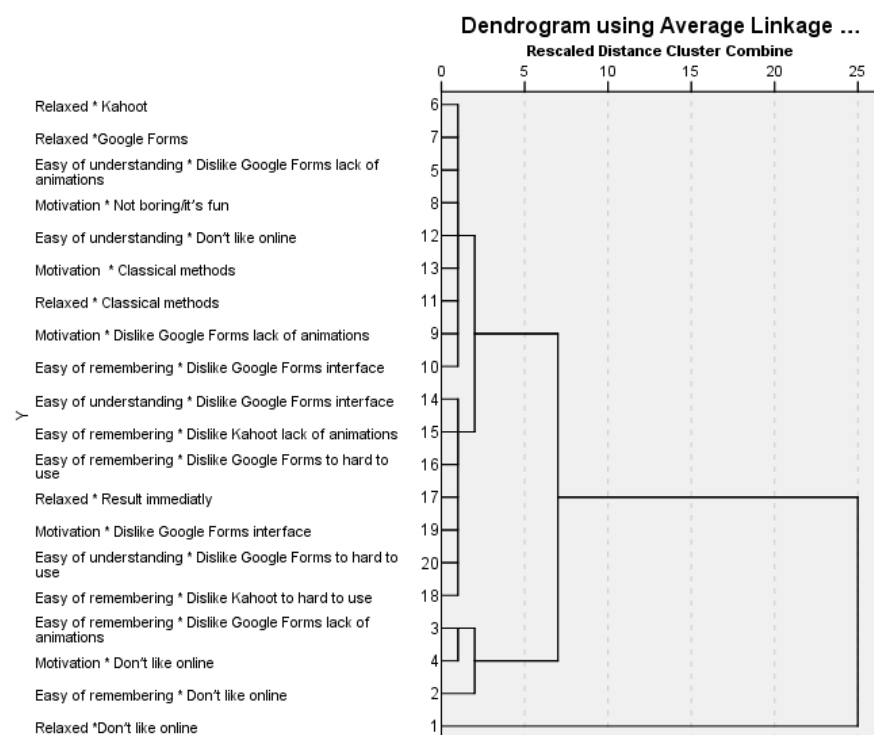


Figure 1. Dendrogram for target group made by students from college. * shows the associations between the variables.

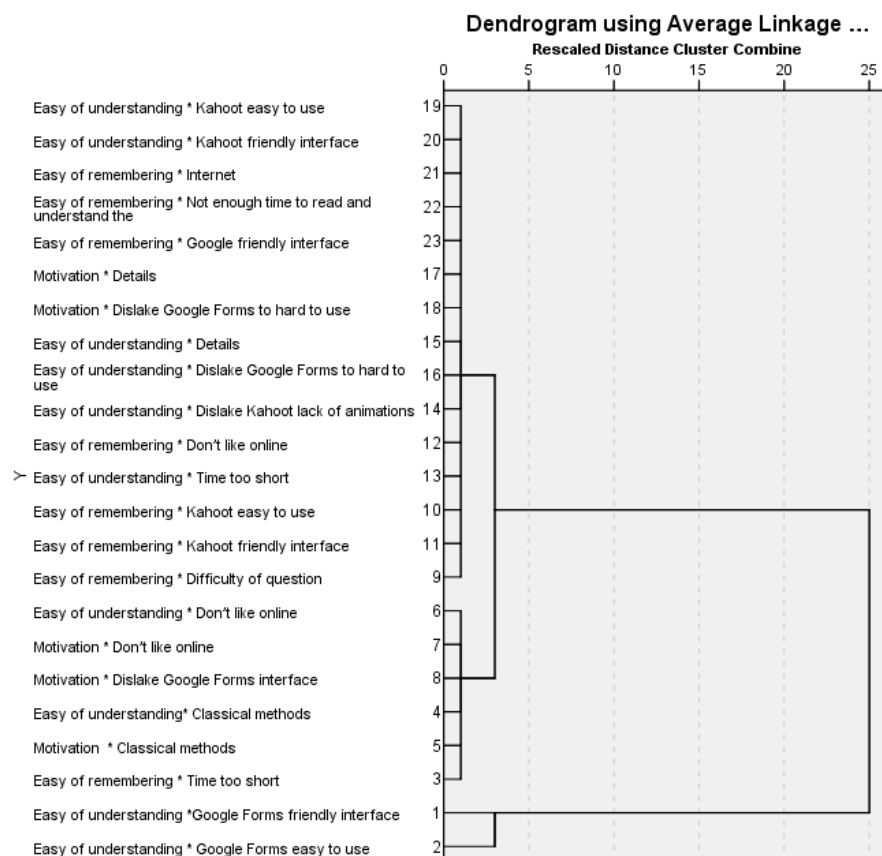


Figure 2. Dendrogram for target group made by students from faculty. * shows the associations between the variables.

The study revealed 7 similarities and the chi-square coefficient showed significant common correlations between the variables ease of understanding, ease of remembering, motivation, reasoning and liking being assessed online; ease of understanding and disliking Google Forms too hard to use; motivation and classical methods; and motivation and disliking Google Forms interface. Until the pandemic period, it was unthinkable to position the student outside the classroom, with school playing an important role in the formation of interpersonal relationships with psychosocial implications. The interpersonal relationships, be they of knowledge, communication or socio-affective [54], created a specific atmosphere in the school environment. Nevertheless, our subjects did not miss them very much, since only 10.52% declared that they did not like online. An important role is played by the level of study of the students. As 12th grade students, they were intensively preparing for the Baccalaureate, so the Geography teacher tried to adapt the teaching strategies to the needs of the students, to create attractive classes for the students who were preparing for the Geography exam and for those who did not choose it. The learners who opted for the Geography exam were motivated to adapt quickly to online learning, paying particular attention to online assessment as a way of getting teacher feedback, improving school progress, and achieving high scores. Conversely, the non-exam takers in Geography were more relaxed, detached, but open to using digital tools. Although the marks obtained by the students in the Kahoot and Google Forms assessments were recorded in the catalogue, they did not influence the results of the survey.

In terms of differences, we found that university students did not respond under the impact of emotions, without focusing on predictors in the dislike category. Unlike the technical college students who rejected some features of the technical design of the Google Forms and Kahoot applications, university students appreciated their design by associating a positive, stimulating connotation with the dependent variables.

Moreover, the technological factor had a major positive impact on the students, as they were used to using ICT tools in their courses, as ArcGis and QGIS courses were included in the curriculum. Although the degree of difficulty of the subject matter, the work tasks, and the contents varied from one group to another, the university students were dissatisfied with the pedagogical factors (time, details, difficulty of the items). They positively appreciated the impact of the Google Forms and Kahoot design in terms of interface and ease of use, though. The lack of animations in Kahoot was considered not to be pleasant.

Motivation also varied among the respondents, depending on the three predictors. In both groups we find a social factor (not boring/it's fun) as a predictor with a positive connotation for motivation. According to Sun et al. [55], some of the factors that influence student satisfaction with online learning systems include: computer/technology anxiety on the part of the learner, perceived usefulness of the LMS, and ease of use.

During the school year 2020–2021 our students spent about 4 months in online learning from November 2020 to March 2021. During this time pupils and students were assessed and graded using Google Forms and Kahoot tests, especially since the school/academic situation required this and because the first semester ended on 29 January 2021. High school students ended the school year on 1 June 2021 and the pass rate for Geography within the target group was 100%. In addition, the results of online learning and real understanding were actually measured through the Baccalaureate exam, with more than half of the high school students taking the Geography exam. They achieved excellent results, the average of the group being higher than the previous generation. Studies have shown that students performed better academically while learning online [56], the percentage of low achievers being 11% lower, that students achieved higher exam scores than those who learned face-to-face [57], and that online learning stimulates students' learning motivation and interest [58].

Alabdulaziz and Tayfour (2023) [59] highlighted the fact that no significant differences were recorded between the mathematics achievement of a group of primary school students who learned face-to-face and a group who learned online. Online testing is recommended for older students [60]. The age of the target group may be an advantage because high school students and university students have developed more learning styles and have a greater degree of learning autonomy. Before the pandemic, none of the two teachers involved in this study had used Google Forms and Kahoot or other e-learning platforms in their classes, so our main concern was the students' acceptance of e-learning as a positive social environment [61] and its effectiveness in the teaching-learning-assessment process of Geography.

5. Conclusions

The study revealed that technical college learners and university students adapted very well to online assessment. The psychological features analysed (motivation, memory, comprehension, and relaxation) interacted mainly with technological and pedagogical factors and less with social/interpersonal ones. The respondents recognised the benefits of online assessment on their psychological processes (motivation, memory, understanding, and relaxation). Comparing the two categories of students, the study revealed both similarities and some differences. Technical college students were more emotional choosing answers focused more on what they do not like, being influenced mainly by technological factors such as Google Forms lack of animations, Kahoot too hard to use and lack of animations, and very little by pedagogical factors (association between motivation and relaxation with classical methods and relaxation with immediate result), and only one with social/interpersonal factors (motivation with not boring/it's fun).

The students' psychological peculiarities interacted both with technological factors such as the internet, the technical design of a Google Forms-friendly interface, Kahoot easy to use and friendly interface, as well as with pedagogical factors (especially the details, not

enough time to read and understand the questions, difficulty of questions, and too short time created problems for the students) but in a negative sense.

We conclude that both technical college and university students appreciated the benefits of online assessment through the use of Kahoot and Google forms tools on both psychological and pedagogical levels. This study is very useful because it provides feedback to both teachers and students, shows how students have done [62,63] in online learning, and what should be improved in the future.

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