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The Impact of Using Online Questionnaires with Instant Response in the Educational Environment. Digital Interactivity during a Pandemic

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Abstract: *The aim of my research was to assess the impact of online questionnaires with instant answer in the educational environment. This article aims to evaluate the impact of using online questionnaires in the educational environment and analyzes the behavioral trends of the participants in light of the results arrived at. The findings highlight the needs that Romanian universities have, in order to be included in the top of modern 21st century universities and shed light on the need for development and maintenance of various types of online questionnaires used in education. Also, this study nuances how a new technological solution for interactive communication and collaboration can be adopted in different situations in the educational environment, in the current and future integration*

scenarios, as well as the ways in which existing technological solutions can be reused in order to avoid the individualistic paradigm, especially in this period, when online is the solution. The results of this study reveal that collaborative learning and the involvement of participants in virtual classes, through various online questionnaires, can improve learning performance. The conclusions reflect the potential benefits of these online questionnaires, both in the favour of those who already use them and those who want to implement them in the future.

Keywords: *online education, online learning, online questionnaires, online educational tools, digital access, digital interactivity, online teacher, virtual student.*

1. Introduction

Lately, in Romania, as well as in other countries, the "online" phenomenon is experiencing unprecedented growth in a multitude of domains of interest, from economics, politics, social life to education. For this reason, most traditional educational functions and activities have moved online, using applications, platforms and various tools and working methods for the online educational environment.

Online education, being a major topic during this period, determines us to reflect more deeply on the role of the teacher and the student in the educational act, as well as on the interaction between them. Teaching in the online educational environment requires not only an understanding of the content, but also a constant concern about how this content is presented and verified to have been understood by the virtual participants.

I believe that a challenge encountered by most people in the educational environment, especially during this period, is to catch the students' attention and to maintain teacher-student interactivity during online learning. How to provide the participant in the online educational event with a relevant learning experience and to be sure that the information transmitted has been understood?

The main purpose of this paper is to address this challenge, by

assessing the impact of using online questionnaires in the educational environment and analyzing the behavioral trends of participants, based on the results of the study.

In this paper, I will analyze the impact of using online questionnaires with instant response in the educational environment, focusing on the need for digital interactivity during a pandemic, given the current crisis situation, due to the existing virus. I will conclude the paper with a few brief general conclusions.

In short, the main outcome of this study is a "theoretical and evaluative radiography" of these online tools in the educational environment.

2. Case study - The impact of using online questionnaires with instant response in the educational environment. Digital interactivity during a pandemic.

By using the new technologies, teachers can save time, organize courses and communicate more effectively with their students. The available support applications allow students to engage actively in the educational act and teachers to evaluate them as learning happens. By using real- time querying, aggregating results, and visualizing, we can get an instant perspective on the levels of understanding.

2.1. The objective of the study

Online learning technologies have been recently developed with speed and innovation in hardware and software and are constantly evolving in all areas, especially in education.

As more and more research begins to consider the integration of pedagogical and technical aspects of innovative online learning technologies in learning environments, we chose to conduct this study to assess the impact of using these technologies in a university in Romania.

Recent Internet and Web technologies help higher education institutions design and provide online educational opportunities to meet the needs of students and adults, such as convenience and flexibility. With the help of these technologies, the number of online programs and courses has increased significantly in the new century.

Despite the increasing number of online courses and programs, online learning still faces several problems. One of the main concerns of online learning is the high dropout rate. Many students easily leave online courses and learning programs or go through them without satisfaction and without being really involved in the educational act.

Keeping students' attention and interest in online education has been actively researched for a long time. Several researchers have pointed out that limiting school dropout and retaining online learners are essential in online learning, as dropout rates are considered an important indicator of online quality.

The main objectives that formed the basis of my research were: evaluating the use of questionnaires in the active learning process; investigating student involvement in the use of technology in the teaching process; improving student involvement in the classroom.

2.2. Methodology used

The methodology used was qualitative research, which is necessary and very important to highlight certain characteristics or behaviors.

In my research, I started by documenting the field of study and collecting more detailed information from several case studies. The information from the qualitative research studies reproduces the information collected as accurately as possible and can be converted into quantitative expressions by coding, and then subjected to certain processing, e.g. counting and comparison to find out the frequency.

Then, I continued with the content analysis and data interpretation, focusing the study on a central idea of the cases, I used several sources of

information (e.g. reports, questionnaires, testimonials, evidence, documents) and I used the comparative method with similar cases, to find the best solutions.

As a qualitative method, I used the case study for this paper. An extensive literature review was conducted, which consisted of both formal documentation sources (dissertations, organizational research, published books) and more informal ones (blogs, wikis and websites).

This review examined the current context of technology, the current digital policies, contemporary digital successes and challenges in schools.

Yoder J. D. defines the case study as "a research strategy that requires empirical investigations into a particular contemporary phenomenon, in a real-life context and using multiple sources of information (interviews, questionnaires, testimonies, evidence, documents)".

Although the case study is not based on quantitative expressions, it does involve some measurements. Based on specific questionnaires, I extracted different concepts related to the central idea that underlies the study. The samples I worked with were selected according to the purpose, and the selection of participants was not random.

Also, I established that the thematic analysis is topical to represent a current problem in the educational environment in this case. The data was collected, then processed to provide the general factors that explain the study and to provide a theoretical framework for future research.

2.3. The educational environment in the current context

A challenge encountered by most people in the educational environment, especially during this period, is to catch students' attention and to maintain interactivity during the educational act. How can a relevant learning experience be provided to the student in this context?

This question was the basis of my study. The participants in the study were teachers and students in Romanian tertiary education, mainly from the Politehnica University of Timișoara, but also in secondary education.

The number of participants in the two case studies exceeded 600 (between 120 and 250 people participating in running a questionnaire). The two studies highlight the importance of using questionnaires during courses and webinars.

The graphs presented in the following section show the results of the tests during the classes and of the webinar presentations. The present studies highlight the importance of interactivity and instant feedback.

2.4. Case study - Use of questionnaires with instant feedback at Politehnica University of Timișoara

The platform used for this study is Socrative. I think one of its most important features is instant feedback. Students can understand the content of the course in real time, through personalized activities, and the teacher can provide an answer on the spot, continuing the course in an adapted form based on the feedback received.

The method presented in this paper is used during the Java Object Oriented Programming course. Its structure is 3 course hours and 2 laboratory hours / 10 weeks + 4 evaluation weeks. Teaching a 3-hour programming class using traditional methods, such as PowerPoint presentations, can make the course boring, making it difficult for students to follow the teacher's explanations for such a long time.

To increase the interactivity of this course, traditional pedagogical methods were combined with interactive questionnaires, initiated on students' mobile devices. Students had to answer these questions using their own mobile phones. Teaching that includes initiating questions during classes is more effective in getting good results from students than teaching without questioning that students understood everything during the traditional presentation.

Before using mobile phones during the course, it was checked if all students have such a device. Fortunately, all the students had a smart phone. If there had been students who did not have such a device, we could

not have used the new method on grounds of discrimination.

Name	Score (%)	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
*****	92%	C	B	A	B	A	A, D	F, D, B,	True	False	E	A	False
*****	75%	A	A	B	B	A	C, A	F, D, B,	True	False	E	A	False
*****	100%	C	B	B	B	A	A, D	F, D, B,	True	False	E	A	False
*****	92%	C	B	B	B	A	B, D	F, D, B,	True	False	E	A	False
*****	67%	C	A	B	B	A	A, D	A	True	True	E	A	True
*****	67%	C	A	A	B	A	B, D	F, D, B,	True	False	E	B	False
*****	83%	C	B	B	B	A	A, D	F, D, B,	True	False	E	B	True
*****	67%	C	A	B	B	C	A, D	F, D, B,	False	False	E	A	True
*****	58%	C	B	B	B	A	A, D	G, D, B	True	True	D	E	True
*****	92%	C	A	B	B	A	A, D	F, D, B,	True	False	E	A	False
*****	75%	C	B	B	B	C	A, D	D, B, A	True	True	E	A	False
*****	83%	C	B	B	B	A	A	F, D, B,	True	True	E	A	False
Class Total		87%	57%	80%	81%	85%	75%	70%	80%	91%	87%	78%	76%

Figure 1. The teacher's mobile interface for instant feedback

IMPLEMENTATION RESULTS

- Socrative allows the teacher to instantly connect with pupils or students as learning happens.
- With this platform, the teacher can quickly assess students' activity with prepared activities or quick questions to get an immediate perspective on students' understanding.
- They can then use the instantly received results to determine the best instructional approach, in order to continue teaching as effectively as possible.
- The teacher can see the results in real time, for a single student or pupil (as the case may be), or the statistics of the general results.
- Student results populate the teacher's screen while sending answers to the questions received. Figure 1 presents the results for one of the tests received by students from the Politehnica University of Timisoara, in the Java Object Oriented Programming course.

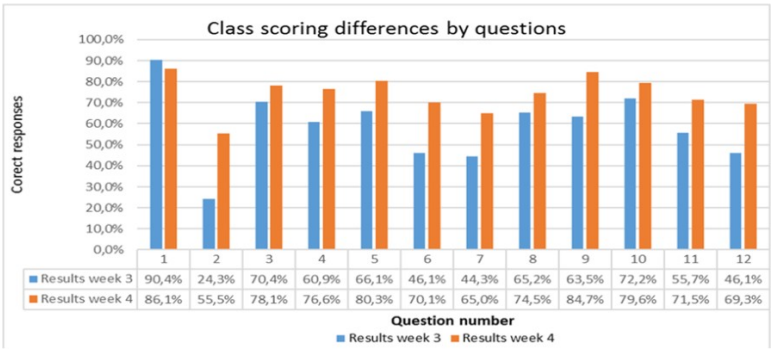

Figure 2. Differences in class scores on questions asked for two consecutive weeks

IMPLEMENTATION RESULTS

- Figure 2 shows the differences in class scores for questions asked for two consecutive weeks. According to the chart above, the general trend is to improve results, but there are two particular cases:
- The first question shows a slight decrease, which can be explained by the fact that it is an easy question, and the students' lack of attention resulted in selecting the wrong answer.
- The results for the second question do not exceed 60%. During the study, I found that if the results are below 60%, it is considered that the problems presented in class were not well understood and with the help of feedback, the teacher must intervene and clarify the specific ambiguities of that course or question, respectively.

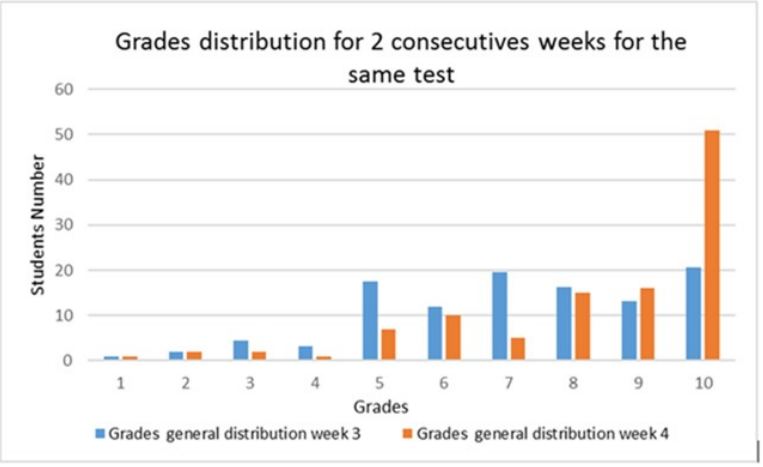

Figure 3. Distribution of grades for two consecutive weeks - same test

IMPLEMENTATION RESULTS

- In the study I used two tests for the same course. In week 3, the test took place at the end of the course, and in week 4, at the beginning of the course.
- The first tests at the beginning of the course contain questions from the previous course, while the last ones, from the current course. Figure 3 shows the comparative results for 2 consecutive weeks for the same test.
- We can see an increase in results; students learn at home to get good grades. Students perform better on tests previously announced with recapitulation questions than on questions to which they have not been exposed before.

2.5. Case study - Use of interactive questionnaires during webinars

Teachers are constantly looking for new ways to increase involvement

and understanding among their students, and the tools they can use to measure students' understanding are among the most valuable in the modern toolkit. Public involvement is the most important thing one can do during a presentation. This can easily happen in the educational act, using a program that allows the audience to become part of the "story", instead of just listening to it. Very often, the biggest problem of the presenter is the uncertainty about what the audience thinks. One of the best ways to find out what the public thinks is to use interactive questionnaires. Conducting live surveys during a presentation session can help the presenter get instant feedback and adjust the presentation based on that feedback.

Next, I will present the results of the second study, namely, the webinars from the Together Online series, initiated by the e-Learning Center, Politehnica University of Timisoara, Romania.

During each webinar, between 120 and 500 participants were present, both from the Politehnica University of Timișoara and from many other universities in the country, as well as people from secondary education, teachers and students.

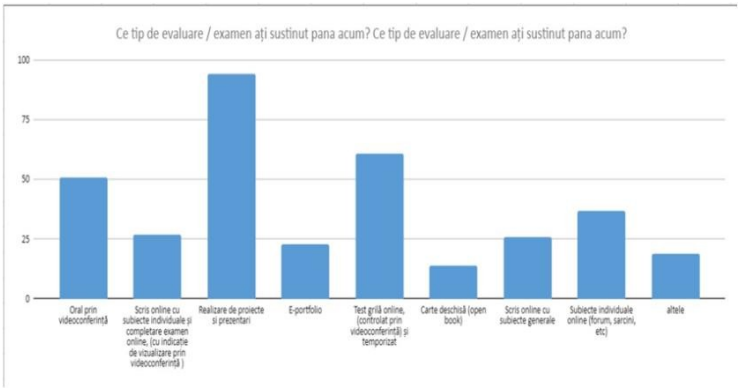

Figure 4. Question asked in order to find out how well the participants know the subject of the presentation and how the presenter can continue the explanations based on these answers

I noticed that the predominant answer is to make projects and presentations. That is why we need to consider these some of the interactive questionnaires, in order to make learning as interactive and effective as possible.

IMPLEMENTATION RESULTS

- The teacher can quickly connect with students, can interact and better explain the concepts presented in the course.
- Facilitating conversation arising from the dynamic development of the presented content.
- One can instantly check if there are any further questions about the presentation.
- Teachers leave the individualistic paradigm, opting for open learning.
- Presentations can easily turn into effective collaborative learning conversations.
- Integration of open learning in education through anonymous responses and debates on the outcome of the various cases presented.

Conclusions - The pedagogical impact

According to the informal data collected from the presented studies I concluded that:

- Collaborative learning significantly helps the learning performance of students and enables the teacher to understand their level of knowledge.
- Furthermore, pupils or students consider that their answers and opinions are valuable for the teacher and colleagues. At the same time, it is easy for the teacher to check how many students understand the concept presented.
- Using online interactive questionnaires helped students to be more

active in class and to understand concepts and facilitates group work.

- These tools also increase communication among teachers, especially in the current context, and support the exchange of collaborative information between them.
- Collaborative learning develops communication skills and enhances collaboration between students and teachers.

Conclusions

The conclusions of this study reflect the potential benefits of online questionnaires, both for the benefit of those who already use them and those who want to implement them in the future.

Testing these tools experimentally in an academic environment, the results of the studies reveal that collaborative learning and student involvement in the classroom improve student learning performance, develop communication skills and a spirit of collaboration between pupils or students, increase interactivity between teacher and students, but also between classmates, which positively influences collaborative learning and student involvement in the educational act. Feedback stimulates the process of directing, controlling and motivating learning and can be the key to success, especially in e-learning.

Through the exchange of knowledge, in which students learn from each other and develop interdependence, students and pupils are able to effectively obtain a huge amount of information, which is useful in generating new ideas for effective learning. The use of online questionnaires in the educational act encourages students to contribute to the answer and to express their opinion. Consequently, students collaborate in the development of their own knowledge. The learning method by using these interactive tools allows students to understand more deeply about the subject and helps them to link new information with previous knowledge.

I strongly recommend the constant use of instant feedback questionnaires as a tool in the educational environment to improve the active learning experience. Despite the fact that the cited researchers emphasize the importance of feedback in electronic courses and although I have demonstrated in previous studies its usefulness in the classroom, the proper and correct use of feedback in electronic courses can still be problematic.

Following this conclusion, I will provide some recommendations that I consider beneficial for improving the use of online questionnaires in the educational environment. Feedback is effective if the learning objectives were achieved in the expected time, the students became more motivated and independent in the learning process. However, most of the time the most important part of using feedback is ignored. This consists in the analysis of the students' results, performed by the teacher, the detection of the error and the correction, but also the modification of the training process in the future.

Whatever the environment (digital or traditional), the teacher must be very attentive to the content, form and timing of providing feedback. Therefore, it is necessary to train teachers in advance, by acquiring professional digital skills.

A limitation of these case studies is that they focus only on a certain sample of people, namely, the users of these types of platforms. Therefore, further research would be to test two different groups of participants: users and non-users.

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