

## DIGITAL TOOLS UTILIZED IN ONLINE, HYBRID AND TRADITIONAL TECHNING MODELS IN PRE-UNIVERSITY STUDIES

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### Abstract

*In connection with the changes imposed in recent years, the trend in education has been set by forms of education based on the use of digital technologies. Thus, also at the level of pre-college education, forms of online education have emerged that are adapted to the legal requirements, to the subject, but also to the experience of the teaching staff in the field of digital skills. In this sense, we have proposed an analysis of the digital systems used in pre-college education. This research is divided into three parts: the analysis of teachers' experiences in the classroom, the use of digital tools, and the process of assessing students using digital methods. The method used in this research is based on a survey based on a questionnaire. The results sought were the opinions of elementary school teachers about the use of digital tools throughout the educational process. The conclusions concerned the degree of use of digital resources in the educational process and proved the reluctance of teachers and parents to use them.*

**Key words:** education, online platform, online evaluation, digital resources, rural education

### INTRODUCTION

In a hyper-connected society, in order to meet the new demands of society, the education sector is going through significant challenges in the process of transforming learning models. The process of teaching how to adequately interact as active and engaged citizens in society is perhaps the most difficult task facing teachers today. Moreover, at the school level, the level of knowledge of teachers and students about digital technologies must be taken into account in order to be able to design new educational models that meet their current needs.

In this sense, this problem has been addressed in several researches from which we recall the objective proposed in the study carried out by Lun et. al. [9] is to investigate the effects of two online platforms (Telegram and Google Classroom) on the frequency of use and ease of use among pre-university students during a Covid-19 pandemic. The main proposed objective is to compare the frequency of use of pre-university students who use any of the online platforms for online learning. In

addition, another aim is to determine the ease of use of both online platforms based on the experiences of pre-university students. The research was based on quantitative indicators for which a random sample of 100 students from the pre-university environment was taken. Quantitative data on frequency of use and ease of use were collected through a survey questionnaire distributed to 100 research participants. The results of the study show the usefulness of Telegram and Google Classroom as online platforms for teaching and learning, including for preschool students. These platforms encouraged preschoolers to be more engaged in learning during the Covid 19 pandemic.

Another work, carried out by Kamal A. A, et. al. [8] shows that “the use of the online environment increased significantly, which led educational institutions to adopt online learning due to health restrictions”. It was “found that online learning would not be a hindrance but a blessing for academic excellence in the face of calamities like the COVID-19 pandemic”.

Another paper analyzed the digital gaps during pandemic of the young generation. Iivari et. al. [6] argues that “information management research should better recognize children, their digitized everyday lives and their basic education as significant areas of concern” and that “we should also aim to influence the basic education of the younger generation – in order to equip them with skills and competences important to them”.

Rural education in the research carried out by Biriescu and Băbăita [4] is one of the important factors in regional development. The authors proposed a software capable of analyzing the performance of the education system in regional development based on major indicators of efficiency and effectiveness.

## MATERIALS AND METHODS

The analysis of the use of digital means in the teaching process at the level of pre-university education was based on a study carried out among teachers from 3 schools. The construction of the questionnaire was done by specifying clearly and in detail the problem to be researched, establishing the theoretical and working hypotheses, establishing the variables and transposing them into questions.

The questionnaire included closed and open questions, precisely to capture the respondents' opinions as best as possible. Closed questions were used to collect quantifiable information, and open questions were used to collect subjective information. The methodology for creating the questionnaires was based on the following considerations: the confidentiality of the respondents was preserved; words and expressions were used according to the meaning of the respondents; questions that may indicate answers were avoided; a certain consistency was sought in the order of the questions, the organization of the questions was made by sections in accordance with the proposed objectives; several categories of questions were introduced, respectively, those of accommodation, difficult questions, easy questions, questions describing the subjects.

To develop the questionnaire, the following stages were completed: the delimitation of the research topic and the sections in correlation with the objectives; making questionnaires in written and online format; organization of data collection procedures; collection of information; creating the database for data entry.

The questionnaire consisted of two sections and 37 questions, of which 5 were open questions. Respondents were also given the opportunity to add their own answers to most questions. We elaborated:

-a section dedicated to teachers that includes information regarding: (seniority, status, field of activity, age, subjects taught, school and educational level at which they teach;

-a section for appreciative evaluation for the last three years of teaching.

In the second section, the questions are focused on the three teaching methods practiced in the last five years in pre-university education, namely: online education – 2020; hybrid education – 2021; physical education – 2022. Frequencies were calculated using IBM SPSS Statistics software [5].

## RESULTS AND DISCUSSIONS

Looking at the life cycle of a food product, it is in an era of rapid technological changes, new ways of cultural production, consumption and dissemination, access to cultural content create great opportunities to promote cultural heritage at home and abroad as a prerequisite for sustainable development [11].

In a modern and dynamic world, where information is updated every second, every person, regardless of age and occupation, is obliged to learn and improve continuously. In the era of new information and communication technologies, the Internet has revolutionized all areas of social and professional life, including education, training and culture. Internet education represents a new way of learning for the student but also a new way for the teacher to teach [3]. The digitization of education brings a challenge to the entire education system, not just distance education [1].

In order to determine the digital models used in primary education, information was analyzed regarding: age, seniority, platforms used in the transmission of information, platforms used in classroom management, use of online course support, types of online applications used, students' access to learning materials online course, online teaching methods, online assessment.

Regarding the age of the teachers, the range with the minimum age at which a teacher can be hired and the average age at which teachers retire was taken as a hypothesis. In this sense, we have established four age ranges presented in Table 1. In the schools where the study was carried out, the highest share (35.7%) was among teachers who are between 30 and 39 years old. According to the data presented, the fewest teachers are young ones with a weight of 14.3%.

Table 1. Age of the teachers

Age	Frequency	Percent	Valid Percent	Cumulative Percent
Under 29 years old	4	14.3	14.3	14.3
30-39 years	10	35.7	35.7	50.0
40-49 years	8	28.6	28.6	78.6
50-59 years	6	21.4	21.4	100.0
Total	28	100.0	100.0	

Source: Own determinations.

The experience in education is given primarily by the seniority of the teaching staff and the performance of an educational unit is analyzed including the share of experienced teachers.

Table 2. Seniority in education

Seniority	Frequency	Percent	Valid Percent	Cumulative Percent
Under 5 years	7	25.0	25.0	25.0
5-9 years	6	21.4	21.4	46.4
10-14 years	5	17.9	17.9	64.3
15-19 years	6	21.4	21.4	85.7
Over 20 years	4	14.3	14.3	100.0
Total	28	100.0	100.0	

Source: Own determinations.

As shown in Table 2, the highest share is recorded for people who have less than 5 years of experience in education. However, cumulatively, the experience of staff with more than 5 years of experience is approximately 75%.

In recent years, the transformations in Romania's economy and implicitly in education had digitization as its main objective. Banciu et al. appreciate that the Romanian digital transformation is in accordance with the European directives in this field, but also with the global trends of the 21st century [2]. In this sense, the digital platforms used in the education process, classroom management platforms, for access to digital information and the types of online applications used in the education process were analyzed [3]. The degree of use of platforms for the transmission of information was presented in Table 3. More than 89% of the interviewed teachers appreciated that they used the Google Meet platform while only 3.6 used the Zoom platform to participate in online lessons with students.

Table 3. Platforms used in the online transmission of information

Platforms	Frequency	Percent	Valid Percent	Cumulative Percent
Google Meet	25	89.3	89.3	89.3
Zoom	1	3.6	3.6	92.9
Google Meet and Zoom	2	7.1	7.1	100.0
Total	28	100.0	100.0	

Source: Own determinations.

Social Media represents a set of electronic platforms, applications, websites that offer various services through an Internet network and can facilitate the creation of links based on various criteria that allow the connection and interaction of users with each other [7].

Table 4. Platforms used for classroom management

Platforms	Frequency	Percent	Valid Percent	Cumulative Percent
Google Classroom	27	96.4	96.4	96.4
Zoom	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Source: Own determinations.

Regarding the digitization of the classroom management mode, as shown in Table 4, more than 96% of the responding teachers used the resources of the Google Classroom platform for classroom management.

According to the study, from the data also presented in Table 5, the most appreciated platform that allowed access to digital resources (over 67%) is School on the internet.

Table 5. Platforms used for access to digital resources

Platforms	Frequency	Percent	Valid Percent	Cumulative Percent
School on the internet	19	67.9	67.9	67.9
EDU network	3	10.7	10.7	78.6
Digitaliada	1	3.6	3.6	82.1
Mozabook	1	3.6	3.6	85.7
Google Classroom	2	7.1	7.1	92.9
Wordwall	1	3.6	3.6	96.4
Other	1	3.6	3.6	100.0
Total	28	100.0	100.0	

Source: Own determinations.

The digital course supports preferred by many teachers are documents in '.pdf' format (Portable Document Format), with a share of over 44% of the responding teachers, data presented in Table 6.

Table 6. Types of course support used in online education

Course support you used	Responses		Percent of Cases
	N	Percent	
Doc	11	19.0	39.3
Pdf	26	44.8	92.9
Youtube	10	17.2	35.7
Website	10	17.2	35.7
Virtual laboratory	1	1.7	3.6
Total	58	100.0	207.1

Source: Own determinations.

According to the teachers, the students had access to the materials throughout the online education period.

The methods by which you received materials are different. In the opinion of the responding teachers, more than 50% appreciated that the students most frequently received materials through the Classroom platform, data presented in Table 7.

Table 7. Students' access to course materials

Student access to course materials	Responses		Percent of Cases
	N	Percent	
During the class taught online	15	29.4	53.6
Through materials sent by email or WhatsApp	9	17.6	32.1
Classroom materials	26	51.0	92.9
On Youtube	1	2.0	3.6
Total	51	100.0	182.1

Source: Own determinations.

Teaching methods differ from one type of education to another. As the educational paradigm has changed, classical methods have been adapted to the new online environment. Thus, over 30% of teachers, according to Table 8, used explanation as a teaching method during the online school period. According to the data presented in this table, the method using scanned documents was the least used method. Preda M. et. al. said that to improve the quality of education in their schools, the teachers indicated specially to change the methods of teaching [10].

Table 8. Online teaching methods used

Teaching methods used during online classes	Responses		Percent of Cases
	N	Percent	
Lecture	6	6.6	21.4
Explanation	28	30.8	100.0
Case Study	7	7.7	25.0
Links to Sites	6	6.6	21.4
Youtube movies	9	9.9	32.1
Online games	13	14.3	46.4
Team works on common document	4	4.4	14.3
Online project	15	16.5	53.6
Scanned documents with solutions	2	2.2	7.1
Other	1	1.1	3.6
Total	91	100.0	325.0

Source: Own determinations.

The educational assessment process has also undergone various updates, as shown in Table 9, more than 16% of the interviewed teachers used tests in the form of online quizzes on various platforms. In this case the most popular platform is Google Forms, which was used by over 13% of all respondents. Evaluation, however, remains a more difficult point, as the study shows, more than 80% of teachers have resorted to traditional methods, using digital methods only for visualization.

Table 9. Evaluation of students in online education

Student assessment in online education	Responses		Percent of Cases
	N	Percent	
Oral	26	44.1	92.9
Written, by showing answers or pictures to the camera	23	39.0	82.1
Questionnaire - Google Forms	8	13.6	28.6
Questionnaire - Own institutional platform	1	1.7	3.6
Questionnaire - Other	1	1.7	3.6
Total	59	100.0	210.7

Source: Own determinations.

## CONCLUSIONS

Analyzing the average age of the teachers, we can say that the analyzed schools benefit from experienced teachers, open to adopting new technologies.

The use of digital resources for the transmission of information to students, classroom management, access to information and creation of digital content have a high share among teachers, which we assume have adapted to the new requirements;

Regarding the evaluation process and the methods used in online teaching, we can see that there is a reluctance to use digital means. Certainly, participation in a continuous training program would reduce these gaps.

## ACKNOWLEDGEMENTS

The paper represents a part of the research project entitled "Evolutia modelelor educationale in contextul transformarii digitale a invatarii - Evolution of the educational models in the context of the digital transformation of learning", financed by Academy of Romanian Scientists" according to the contract No. 36/April 14, 2022, concluded for the period May 1, 2022-December 17, 2022. Also, the paper is a part of the research work destined to finalize the Ph. D. thesis of Ionela Simona SIPCĂ (ALDEA).

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