

DIGITAL TEACHING BEHAVIORS IN 2020-2022 IN PRE-UNIVERSITY INSTITUTIONS FROM URBAN AND RURAL AREAS

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Abstract

Due to the changes that the pandemic imposed on the educational system, three periods can be identified in Romania, depending on the teaching methods used: Online teaching - 2020; Hybrid teaching - 2021; Traditional teaching (in physical format) - 2022. In each of these periods, teachers had to adapt their teaching style and use specific digital tools and applications. In this paper, we present the research conducted as part of doctoral theses in 7 pre-university institutions (2 high schools from urban environments and 5 secondary schools from rural environments), where questionnaires were collected from 100 teachers. The results revealed differences in the way of approach to teaching in the three analyzed periods, with a pronounced traditional behavior in the rural environment and with an obvious reluctance to change.

Key words: urban and rural education, teaching behaviour, digital tools, digital applications

INTRODUCTION

In 2020, during the pandemic, it became clear that traditional teaching often does not match the innovative model of online education, but also that teachers need experiences that integrate digital technologies into learning and technical training in the use of digital tools [11]. Some studies have shown that in just a few months, skills in using digital technologies for instruction have improved and confidence in using technology for instruction, assessment, feedback, and communication has increased [2] access to technology and many challenges (economic and social), especially in 2020 [8, 9, 3], and a lack of support for remedial programs in 2021, which was reflected in students' poor grades [7].

From 2021, schools gradually tried to return to normality, and the various forms of hybrid teaching were replaced by traditional teaching. De Souza Júnior et al [4] pointed out that there are some factors that could influence the incorporation of digital technology in traditional education in the

future: "1) the teaching concept, 2) the belief in digital technology as a way to relate to physical education, and 3) the pedagogical time for planning". Other authors believe that we need to integrate digital technologies into the classroom to improve the quality of knowledge transfer [12] or to increase student engagement and motivation [6].

We must understand that in recent years the whole society has undergone major transformations that required interventions and political initiatives to respond to the challenges. As a response to these challenges was developed at European level the "Digital Education Action Plan" [5] and in the field emerged the concept of Education 4.0 like a new educational paradigm. However, to implement all these new ideas and concepts many countries need investments in ICT infrastructure, in the development of digital skills and the promotion of an adapted curricula. In Romania for example, many authors and stakeholders consider that the promotion of this technology-oriented approach is not yet possible [10].

There are many reasons, known since the pandemic period, why it is so difficult to transform the Romanian educational system: the great differences between urban and rural areas, the inadequate infrastructure both at the level of schools and at the level of the Internet network, etc.

These inadequacies, dating back to the past years, have always been a focus of educational reform strategies.

It is believed that as long as solutions to the current structural problems are not found, the only way forward is to introduce various elements of digitization within the system.

In addition, many teachers are still reluctant to introduce digitization into their jobs, preferring to return to the way they taught before the pandemic.

They are unwilling to continue using what ICT tools they have acquired in recent years. One might ask why this is, but we believe the correct question is:

Did teachers use digitized teaching methods during the pandemic, or did they simply use technology to help them implement teaching methods specific to traditional teaching? Therefore, we believe that this research, conducted at the level of teachers from different residences and educational levels,

can give us an answer to this question and show their behavior in the period 2020-2022.

MATERIALS AND METHODS

In 2022, we carried out a survey based on a questionnaire among the teaching staff in pre-university education. The survey was conducted in two high schools from urban areas (Gh. Cherchez Technological College Ion Ghica Theoretical High School from Racari) and five schools from rural areas (Slobozia Moara Secondary School, Cotesti – Godeni Secondary School, Tartasesti General School, Lunguletu School No. 2. Serdanu General School). We collected 100 questionnaires from 47 teachers from urban areas and 53 teachers from rural areas. The main objective of the questionnaire was to investigate how they integrated technology into the teaching process in the period 2020-2022.

The questionnaire was structured on multiple sections (with 37 questions) focused on the following periods: online education – 2020; hybrid education – 2021; physical education – 2022. The results were processed with IBM SPSS Statistics software.

The main characteristics of the respondents are presented in Table 1.

Table 1. The main characteristics of respondents by residential environments

Variable	Labels	Urban		Rural	
		Frequency	Percent	Frequency	Percent
Seniority in education	Under 5 years	8	17.0	3	5.7
	5-9 years	8	17.0	12	22.6
	10-14 years	10	21.3	12	22.6
	15-19 years	8	17.0	12	22.6
	Over 20 years	13	27.7	14	26.4
Seniority in school	Under 5 years	20	42.6	11	20.8
	5-9 years	9	19.1	16	30.2
	10-14 years	11	23.4	8	15.1
	15-19 years	3	6.4	5	9.4
	Over 20 years	4	8.5	13	24.5
Holder	Yes	31	66.0	41	77.4
Age	Under 29 years	5	10.6	1	1.9
	30-39 years	15	31.9	20	37.7
	40-49 years	16	34.0	20	37.7
	50-59 years	9	19.1	10	18.9
	Over 60 years	2	4.2	2	3.8
Educational level	Primary education (grades 0 – 4)	8	17.0	18.0	34.0
	Secondary education (grades 5 – 8)	10	21.3	34	66.0
	High school education (grades 9 – 12)	29	61.7	-	-
Total		47	100,0	53	100,0

Source: Own determinations.

From Table 1, we may easily notice that:

- 47 respondents from urban areas; 66% are holders; 34% have under 10 years in education and almost 62% have under 10 years in their school;
- almost 62% are teaching in high schools;
- 53 respondents from rural areas;
- 77.4% are holders;
- around 28% have under 10 years in education and almost 62% have under 10 years in their school;
- 66% are teaching in secondary schools and 34% in primary schools.

RESULTS AND DISCUSSIONS

During the pandemic period, when all educational systems implemented online

teaching, there were two main platforms (videoconferencing services) used by Romanian teachers: Google Meet (55%) and Zoom (32-38%) (Table 2). The main tool for class management was also from Google, with a 66% share in urban areas and 92.5% in rural schools.

In 2020, there were many sources of digital resources. Two of them were already established at the institutional level, namely Scoalapenet.ro and Edu.ro. Our data show that the latter website was more used by rural teachers (almost 70%), along with their own sources posted in Google Classrooms (13.2%). Urban teachers' preferences were distributed between these two websites (about 40-45% each).

Table 2. The teaching behavior of teachers during the online education period (2020-2021), by residential environments

Variable	Labels	Urban		Rural	
		Frequency	Percent	Frequency	Percent
Main platform for online classes	Google Meet	26	55.3	29	54.7
	Zoom	18	38.3	17	32.1
The main platform for classroom management	Google classroom	31	66.0	49	92.5
The platform for access to digital resources and for creating teaching materials	Scoalapenet.ro (School on the internet)	19	40.4	3	5.7
	Edu.ro	21	44.7	37	69.8
	EDU Network				
Course manual type (Multiple variable)	Google Classroom	2	4.3	7	13.2
	Pdf	42	40.0	28	23.7
	Word	22	21.0	33	28.0
Apps for teaching (Multiple variable)	YouTube	23	21.9	37	31.4
	Microsoft Office	35	35.0	34	29.8
	Gmail	23	23.0	13	11.4
Devices (Multiple variable)	Google Forms	14	14.0	15	13.2
	Google Docs	6	6.0	16	14.0
	Jam board	2	2.0	13	11.4
Apps for communication (Multiple variable)	Laptop	45	55.6	50	53.8
	Phone	32	39.5	40	43.8
	WhatsApp	32	38.1	46	52.3
Access of the students to information (Multiple variable)	Email	27	32.1	18	20.5
	Google Classroom	23	27.4	22	25.0
	During online classes	30	36.1	43	39.8
Main teaching methods (Multiple variable)	Email or WhatsApp	23	27.7	34	31.5
	Google Classroom	28	33.7	28	25.9
	Explanation	47	28.3	53	29.9
Evaluation type (Multiple variable)	Online games	31	18.7	24	13.6
	You Tube movies	21	12.7	38	21.5
	Collaborative online project	16	9.6	7	4.0
Evaluation type (Multiple variable)	Websites	11	6.6	16	9.0
	Online - oral	45	40.2	46	37.7
	Online - Online - written, by showing answers to the camera or pictures	39	34.8	35	28.7
	Google Forms	22	19.6	35	28.7

Source: Own determinations.

In urban schools, the didactic support for classes were in pdf (405) or word format (21%), but some teachers used also You Tube films (22%).

Table 3. The teaching behavior of teachers during the online education period (2021-2022), by residential environments

Variable	Labels	Urban		Rural	
		Frequency	Percent	Frequency	Percent
Main platform for online classes	Google Meet	27	54.0	33	48.5
	Zoom	21	42.0	16	23.5
	Teams	2	4.0	19	27.9
The main platform for classroom management	Google classroom	42	89.4	52	98.1
The platform for access to digital resources and for creating teaching materials	Scoalapenet.ro (School on the internet)	18	38.3	3	5.7
	Edu.ro	22	46.8	42	79.2
	EDU Network	2	4.3	6	11.3
Course manual type (Multiple variable)	Google Classroom	2	4.3	6	11.3
	Pdf	33	20.2	33	14.7
	Book	28	17.2	35	15.6
	Website	26	16.0	23	10.3
	You Tube	19	11.7	34	15.2
Apps for teaching (Multiple variable)	Printed handbook	20	12.3	38	17.0
	Microsoft Office	41	40.6	45	46.9
	Gmail	29	28.7	23	24.0
	Google Forms	10	9.9	4	4.2
	Google Docs	7	6.9	11	11.5
Devices (Multiple variable)	Jam board	1	1.0	8	8.3
	Laptop	44	55.0	50	45.0
	Phone	27	33.8	42	37.8
	Projector	2	2.5	12	10.8
Apps for communication (Multiple variable)	WhatsApp	32	31.7	42	35.9
	Email	29	28.7	35	29.9
	Google Classroom	24	23.8	26	22.2
Access of the students to information (Multiple variable)	During online classes	16	19.0	12	9.4
	Email or WhatsApp	25	29.8	18	14.1
	Google Classroom	27	32.1	33	25.8
	You Tube	6	7.1	21	16.4
	During classes face-to-face	7	8.3	27	21.1
Main teaching methods in online (Multiple variable)	Explanation	44	31.9	53	44.2
	Online games	15	10.9	5	4.2
	You Tube movies	21	15.2	34	28.3
	Collaborative online project	15	10.9	5	4.2
	Websites	9	6.5	11	9.2
Main teaching methods in physical (Multiple variable)	Explanation	43	33.9	51	42.1
	Team work	22	17.3	18	14.9
	Project	17	13.4	12	9.9
	You Tube movies	20	15.7	18	14.9
Evaluation type (Multiple variable)	Online - oral	45	24.2	32	12.8
	Online - written, by showing answers to the camera or pictures	38	20.4	44	17.6
	Google Forms	15	8.1	15	6.0
	In physical - oral format	31	16.7	34	13.6
	In physical - written format	30	16.1	35	14.0
	In physical - project	10	5.4	21	8.4
	In physical - portfolio	16	8.6	33	13.2

Source: Own determinations.

In rural areas, more teachers used videos from You Tube (31.4%) and the minimum format of the accompanying books was Word. 30-

35% of teachers used Microsoft Office programs and 11% of rural teachers and 23% of urban teachers used Gmail to plan and

communicate lessons. Teachers relied primarily on their personal laptops and phones to transmit information. The most commonly used apps were WhatsApp and email (over 70%) and Google Classroom (25-27%). However, according to them, almost 40% of students had access to the information during online classes.

Regarding teaching methods, about 30% of teachers used oral explanations in class. They used online games and You Tube videos (31% in urban and 35% in rural areas), and about 9% promoted collaborative online projects (mainly in urban schools) and links to various websites (mainly in rural schools). Knowledge assessment was done online by listening orally or in writing, showing answers to the camera, or sending pictures via WhatsApp. Only 28.7% of rural teachers and 19.6% of urban teachers answered the questionnaire using Google Form.

In 2021, schools opened in a mixed mode with class rotation (students online and students physical), with some subjects online and others physical, or with classes taught entirely online, depending on the level of infestation. The mixed forms differed from the point at which stakeholders considered the number of cases in the cities/villages.

In the second section, respondents were asked to rate the amount of time they teach in hybrid ways (Table 3). Our results show an increase in users of Teams and the EDU network. Support for learning also became more diverse, from pdfs and You Tube movies to printed books and manuals. In fact, 30-32% of teachers began relying on printed versions of instructional materials, but 25-28% still used supplemental You Tube movies and websites. We also observed a decline in the use of online tools such as Google Docs or Google Forms, but teachers continued to use laptops, phones, WhatsApp, email, and Google Classroom for communication.

In rural schools, 26% of students had access to classroom materials via Google Classroom, 16% via You Tube, and 21% during class. Only a maximum of 20% still have access to textbooks via email, WhatsApp, and online.

While in online classes teaching methods remained the same, in physical classes

teachers used explanations (about 34-42%), teamwork (15-17%), projects (10-13%) and You Tube movies (15-16%). Regarding assessment, in urban schools, 44% of teachers used online assessment, 8% used Google forms, and 45% used in-class assessment; in rural schools, only 28% of teachers used online assessment, 6% used online questionnaires, and almost 50% used in-class assessment. A major reason for this was that Covid cases were much more common in urban areas.

At the end of the 2021-2022 academic year, most students returned to schools and physical attendance became mandatory (the situation was the same in the academic year 2002-2023). The main digital tools were laptops and PowerPoint presentations, but 23-35% of teachers still used You-Tube movies (Table 4).

The manuals were offered to the pupils especially in printed format, only 20-25% were transmitted in pdf format.

However, we are seeing a trend toward digital apps, especially in rural areas. More and more teachers are using Google Docs instead of offline Word (about 20%), and there are more people using interactive whiteboards. We can see that due to the pandemic period, investments have been made in IT equipment and digital tools such as laptops and interactive whiteboards.

Classroom materials were delivered via digital means (WhatsApp, email, Google classroom) over 90% of the time in urban schools, but only 75% of the time in rural areas.

The rest of the teachers gave printed materials to students in class. According to respondents, students in rural areas were able to access instructional materials via Google classroom (29.5%), during class (26.3%), and You Tube (17.9%); students in urban areas were able to access instructional materials mainly via Google classroom (44%), during class (18.6%), but also via email or WhatsApp (27.1%).

Rural teachers diversified their methods by introducing YouTube materials and case studies to a large extent. Assessment was exclusively in class, and in addition to traditional assessment (oral and written), a

preference for projects was noted in urban schools and portfolios in rural schools.

Table 4. The teaching behavior of teachers during the online education period (2022-2023), by residential environments

Variable	Labels	Urban		Rural	
		Frequency	Percent	Frequency	Percent
Digital tools (Multiple variable)	Laptop	12	40.0	34	54.8
	PPT	6	20.0	5	8.1
	You Tube	7	23.3	22	35.5
Course manual type (Multiple variable)	Pdf	28	24.8	29	19.3
	Books	28	24.8	41	27.3
	Printed handbook	23	20.4	42	28.0
	Collection/auxiliary materials	11	9.7	23	15.3
Apps for teaching (Multiple variable)	Microsoft Office	34	47.2	35	38.0
	Gmail	19	26.4	13	14.1
	Google Forms	9	12.5	5	5.4
	Google Docs	3	4.2	19	20.7
Devices (Multiple variable)	Laptop	45	60.0	53	52.5
	Interactive board	17	22.6	24	23.8
Apps for communication or the way the teaching materials are transmitted (Multiple variable)	WhatsApp	22	30.6	27	29.3
	Email	21	29.2	26	28.3
	Google Classroom	21	29.2	16	17.4
	Printed handbook	6	8.3	17	18.5
Access of the students to information (Multiple variable)	Email or WhatsApp	16	27.1	4	4.2
	Google Classroom	26	44.1	28	29.5
	During classes face-to-face	11	18.6	25	26.3
	YouTube	3	5.1	17	17.9
Main teaching methods in physical (Multiple variable)	Explanation	45	30.2	53	30.1
	Team work	20	13.4	15	8.5
	Project	22	14.8	15	8.5
	You Tube movies	20	13.4	35	19.9
	Case studies	17	11.4	27	15.3
Evaluation type (Multiple variable)	In physical - oral format	42	31.8	52	33.1
	In physical - written format	43	32.6	47	29.9
	In physical – project	14	10.6	32	20.4
	In physical - portfolio	24	18.2	23	14.6

Source: Own determinations.

Table 5. Integration of technology in the teaching methods

Variable	Labels	Urban		Rural	
		Frequency	Percent	Frequency	Percent
Traditional teaching methods (Multiple variable)	Worksheet	32	22.9	41	18.6
	Handbook	29	20.7	43	19.5
	Explanation	21	15.0	38	17.2
	Exercises	18	12.9	39	17.6
	Collection	19	13.6	33	14.9
Modern teaching methods (Multiple variable)	IT equipment (laptop, video projector, tablet)	18	30.5	5	8.1
	Learning through discovery	17	28.8	37	59.7
	YouTube	5	8.5	7	11.3
Digital tools in the future (Multiple variable)	Laptop	41	31.5	52	25.6
	Email	19	14.6	33	16.3
	You Tube	18	13.8	38	18.7
	Websites	18	13.8	36	17.7
	PPT	18	13.8	36	17.7

Source: Own determinations.

After all the experience from 2020-2022, we find that there has been little change in the behaviour of teachers. In the last section of the survey, they were asked to indicate which teaching methods and digital tools they would

like to use in the future. They see the use of IT and You Tube as modern teaching methods (especially in urban areas), alongside discovery learning, which is the main method in rural areas (almost 60%) (Table 5).

Moreover, only 27% of urban teachers and 36% of rural teachers plan to use YouTube movies and websites in their activities in the future.

CONCLUSIONS

Digitization is a challenge for the Romanian education system [1], while many stakeholders talk about the digitization of education. Almost all teachers from urban and rural schools are also confused about these concepts. We need to understand that digitization means transferring information into digital technologies, while digitalization means transforming information (which is analogue) into digital information.

In 2020-2022, we have not developed any of these processes in education. We have simply subjected education to a forced digital transformation, i.e., we have used current digital technologies to impart knowledge to students. In this situation the teachers.

In this context, teachers were content to acquire or apply basic skills in the use of computer programs. For them, the use of a laptop or ppt still represents the modern teaching method. The only digital developments observed are: the supplementation of the information from the courses with You Tube videos or with links to different websites through which students can access the information; the use of Google Classroom as a storage medium for manuals or exercise books in general pdf format (an activity that has been reduced after the return to face-to-face teaching); the use of email or the WhatsApp application for communication (but this too has been reduced as the communication between students and teachers in class is being redeveloped, leaving these applications as a backup).

There are few teachers who have actually tried to create digital content using various apps like Kahoot or Powtoon, and the number using them in the present is even smaller.

However, we must understand that teachers do not have the skills to develop such content. Our research found that they were willing to use various existing applications (especially in rural areas) to support the educational process.

But this is an institutional problem, not a knowledge problem. They need support from specialized companies, access to digital tools that can be used to create content (and that are usually paid for), and also training in how to use them. Simply having interactive tablets or computers does not mean that we are introducing digitalization or digitalization in education.

We need digital tools and digital content to support modern education, which is innovative learning accompanied by technology or the use of apps that can support blended learning. Otherwise, all we can have been a digital transformation but with the same out-of-date content.

In our opinion, it's not the curricula that's the problem, but the way we try to convey information to Generation Z children. Nearly half of our respondents said that their students prefer face-to-face instruction and traditional teaching methods. Then we ask again a simple question that seems to have no answer in our society: if our current way of teaching is better, why is student achievement so poor? If we believe that students prefer to read a book, why are they so attracted to phones? We teachers need to adapt, and we need stakeholder support to do so.

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