

THE CHALLENGES OF ONLINE TEACHING IN UNIVERSITY EDUCATION

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***Abstract:** The transition to online teaching presupposed the acceptance of the need to implement changes in terms of paradigm, mentality, training, so that classic and modern psychological and pedagogical theories were reconsidered. This article also aims to identify, in the teachers' perception, the specific elements of the design and development of online teaching activities, and to identify the teachers' perception of the degree of support received from support and guidance providers, as well as the support and guidance needs of teachers. Also, the study of the difficulties encountered by teachers and students in online didactic activities, as well as the teachers' perception of the degree of completion of the didactic contents by the students. At the same time, we were interested in identifying the actions taken by university teaching staff to support student motivation in the context of online teaching activities. The confirmatory research carried out by us based on the questionnaire had as subjects, 32 university teaching staff. The article ends with the descriptive statistics of the results obtained and with the formulation of the most important conclusions regarding the challenges of online teaching. The main difficulties encountered by students during the online learning period concerned the use of technology as well as the lack of non-performing devices. University teaching staff consider the continued use of digital tools and resources in face-to-face activities to be important and helpful.*

***Keywords:** online teaching, university education, teaching support, teaching-learning platforms*

1. Introduction

Looking towards the future of education, Professor Emil Păun ¹ notes the following fundamental features that will outline the overall picture of the educational environment. First of all, the persistence of the school form of achieving education and learning, modified by the significant contribution of Information and Communication Technology (ICT), as well as the evolutionary contributions of pedagogical digitization, which will keep learning at the center of activity, is anticipated cautiously, from educational institutions. Secondly, the presence of hybridized learning opportunities is expected, balancing formal learning experiences with non-formal and informal ones, without the educational environment going through radical transformations that will convert it into an online environment, where the school adopts the unique electronic model. The school will also develop transferable skills relevant to various professional contexts, facilitating rapid and efficient integration into the labor market, both at an individual and social level. At the same time, there will be an emphasis on talent management, to emphasize the role of education in humanizing efforts and avoid dropout.

¹ Emil Păun, *The school of the future or the future of the school? Perspectives on post-pandemic education*, Bucharest, Polirom Publishing House, 2022.

In accordance with these characteristic features, we also identify other valuable approaches, for example, UNESCO's contribution ²presents humanistic perspectives on the future of education based on nine ideas of action, aimed at the entire educational environment, as follows: strengthening the position of education as a common good (action 1); expanding the definition of human rights (action 2); valuing the teaching profession and collaboration between teaching staff (action 3); promoting the participation and rights of students, young people and children (action 4); protecting the social spaces that represent the school (action 5); ensuring teachers' and students' access to new technologies and information sources (action 6); the inclusion of scientific literacy in public education programs (action 7); promoting world solidarity (action 8); protecting national and international funding of education (action 9).

These approaches emphasize the importance of a holistic and inclusive approach in the future development of educational systems, adapted to face contemporary challenges and to capitalize on the opportunities brought by new technologies.

2. Theoretical foundations

In the context of the measures adopted during the period marked by the Covid-19 pandemic, the transition to online teaching assumed the acceptance of the need to implement changes in terms of paradigm, mentality, training, so that classic and modern psychological and pedagogical theories were reconsidered.

Albulescu³ emphasizes that education systems must adapt to respond and capitalize on the significant changes brought by information and communication technology. This adaptation process involves: access to a large volume of available information; the formation of new learning skills; maximizing e-Learning opportunities; recognizing the interests and needs of the "internet" generation; promoting lifelong learning; removing time and place limitations; greater inclusion in education through e-Learning.

Also, the MEN report "Online school: Elements for educational innovation" ⁴formulates recommendations in order to:

- ✓ Rethinking the national education system to achieve a balance between the technological components of the educational process and the traditional aspects of the teaching activity.
- ✓ Focusing on quality, including aspects such as the effectiveness of the teaching process, authentic student progress and engagement, rather than the simple use of digital platforms and tools.
- ✓ Engaging experts to provide expert and personalized support tailored to the specific needs of educational practitioners.
- ✓ Creation of specialized support groups consisting of academic and research experts, such as specialists in pedagogy, e-learning and other relevant fields, to analyze, propose and validate solutions formulated by teachers and the private sector.

² UNESCO, *Developing the Humanistic Perspective on the Future of Education: New Ideas for Action* [Working Paper]. 2020.

³ Ion Albulescu, Horatiu Catalano (coord.), *e-Didactics. The training process in the online environment*. Bucharest, Didactica Publishing House, 2021.

⁴ Ministry of National Education. *The Online School: Elements for Educational Innovation*. [Report]. 2020.

- ✓ Extending the educational reach of tools and support materials.
- ✓ Development of an Open Educational Resources (EOR) database.

On the other hand, Perțea&Norel⁵ present features of programmed instruction, self-regulated learning and situational learning from the perspective of the online learning environment.

Among the recent theories related to online teaching we list:

- ✓ **Theory of Online Active Learning**⁶ emphasizes the importance of the active involvement of students in the online learning process. The use of interactive methods, such as small group discussions, collaborative projects and problem-solving activities, is promoted to enhance student engagement and understanding. Digital tools such as: discussion forums, collaboration platforms (Google Docs) and simulation software are used to facilitate this approach.
- ✓ **Blended Learning Theory**⁷ combines traditional classroom teaching with online components. This theory suggests that a combination of face-to-face and online learning can provide a more balanced and effective educational experience. For example, lessons can be taught online through recorded lectures, and classroom time can be dedicated to interactive and knowledge-building activities.
- ✓ **Adaptive Learning Theory**⁸ uses artificial intelligence technologies and algorithms to personalize each student's learning experience. Adaptive learning platforms adjust teaching materials and methods to individual student needs and performance, ensuring that all students progress at their own pace.
- ✓ **Online Social Learning Theory**⁹ emphasizes the importance of social interaction and collaborative learning in the online environment. Discussion forums, online study groups, social networks, and other digital communication tools are used to encourage students to interact, share ideas, and collaborate on projects.
- ✓ **Theory of Online Experiential Learning**¹⁰ focuses on learning through direct experience and reflection. In the online environment, this theory can be applied through the use of simulations, educational games, case studies and practical projects that allow students to apply theoretical knowledge in real or simulated situations.

⁵ Andra Perțea, Mariana Norel, *Conceptual and methodological framework of teaching-learning-evaluation redefined in the online education paradigm*. In B. Almășan, A. Dumitrache, A. Perțea, M. Norel, & M. Horumba (Eds.), *The online teacher's practical guide*. Bucharest, University Publishing House, 2022.

⁶ C.C. Bonwell, J.A. Eison, *Active Learning: Creating Excitement in the Classroom*. ASHE-ERIC Higher Education Report No. 1. George Washington University, School of Education and Human Development, 1991.

⁷ D.R. Garrison, N.D. Vaughan, *Blended Learning in Higher Education: Framework, Principles, and Guidelines*. Jossey-Bass, 2008.

⁸ P. Brusilovsky, É. Millán, *User models for adaptive hypermedia and adaptive educational systems*. In P. Brusilovsky, A. Kobsa, & W. Nejdl (Eds.), *The Adaptive Web: Methods and Strategies of Web Personalization* (pp. 3-53). Springer, 2007.

⁹ Albert Bandura, *Social Learning Theory*. Englewood Cliffs, NJ: Prentice-Hall, 1977.

¹⁰ D.A. Kolb, *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall, 1984.

- ✓ **Formative Feedback Learning Theory**¹¹ emphasizes the role of formative feedback as essential in online teaching as it helps students understand where they are in the learning process and how they can improve their performance. Online platforms offer multiple ways to provide quick and detailed feedback, such as rubrics, written comments, audio/video feedback, and self-administered tests.
- ✓ **Online Learning Community Theory**¹² argues the importance of developing a sense of community and belonging among students is crucial to the success of online learning. Synchronous and asynchronous communication tools, such as video conferencing, chats, and discussion forums, are essential to building and maintaining this community.
- ✓ **Theory of Mobile Learning**¹³ refers to the use of mobile devices (smartphones, tablets) to access educational materials and participate in learning activities. This theory emphasizes the flexibility and accessibility offered by mobile devices, allowing students to learn anywhere and anytime.

Almasan et al.¹⁴ points out the significant advantages of online learning, especially when it is effectively implemented and integrated into teaching. They highlight the importance of developing pre-university teaching staff's curricular skills to facilitate both physical (face-to-face) and online learning. It also emphasizes the need to form, maintain and strengthen an innovative environment for digital and traditional learning and teaching, with the aim of ensuring quality and excellence. In addition, it emphasizes supporting student-centered teaching delivery and creating an environment conducive to learning, as well as building and sustaining a diverse and inclusive culture. This is achieved by promoting a climate of transformative learning, which facilitates relationships between teachers and students as future ethical citizens, involved in local and European communities.

All these theories reflect the diversity of approaches in online teaching and emphasize the importance of adapting educational methods to the needs and preferences of students in the digital environment.

3. Research objectives

Because online teaching during the pandemic period was a real challenge for students and teachers, we proposed that through this confirmatory research:

1. We identify, in the perception of teaching staff, the specific elements of designing and carrying out online teaching activities.
2. We identify the teachers' perception of the degree of support received from the support and guidance providers, as well as the teachers support and guidance needs.
3. We study the difficulties encountered by teachers and students in online teaching

¹¹ D.J. Nicol, D. Macfarlane-Dick, *Formative assessment and self-regulated learning: A model and seven principles of good feedback practice*. *Studies in Higher Education*, 31(2), 199-218, 2006

¹² D.R. Garrison, T. Anderson, W. Archer, *Critical inquiry in a text-based environment: Computer conferencing in higher education*. *The Internet and Higher Education*, 2(2-3), 87-105, 2000.

¹³ J. Kukulska-Hulme, J. Traxler (Eds.), *Mobile Learning: A Handbook for Educators and Trainers*. Routledge, 2005.

¹⁴ A. Almășan, A. Dumitrache, A. Perțea, M. Norel, & M. Horumba (Eds.), *The online teacher's practical guide*. Bucharest, University Publishing House, 2022.

activities.

4. We study the teachers' perception of the degree of completion of the didactic contents by the students.
5. We identify the actions undertaken by university teaching staff to support student motivation in the context of online teaching activities.

4. Research methodology

In order to achieve the objectives of the research, we carried out a survey based on a questionnaire, by building an online questionnaire, applied in Google forms and which totaled 10 questions, of which the first 9 with answers of your choice, and the last question requested the construction an own answer. This questionnaire was applied to a number of 32 university teaching staff, from the "1 December" 1918 University in Alba-Lulia. Among the research subjects, 75% were women, and 25% were men.

5. Research results

In what follows, we present the results of the ascertainment research carried out by us based on the questionnaire applied to a number of 32 university staff. The first question of the questionnaire aimed to identify the aspects that mattered the most during online teaching, in terms of designing and conducting effective learning activities. Thus, 75% of the surveyed subjects indicated that the pedagogical aspects related to the management of learning situations, didactic communication, choosing the right methods and tools for interaction and evaluation, providing feedback, monitoring progress and the support offered in learning mattered. Among the university teaching staff, who answered the questionnaire, 18.80% mentioned the fact that the content aspects of the discipline mattered most, for example: knowledge in the field of specialization and thorough mastery of the subject, and 6.30% named the technical aspects as important specific to the use of new technologies, for example: creating accounts, software tools, initiating synchronous sessions - videoconferences/webinars/chat. The results are represented graphically in Figure 1.

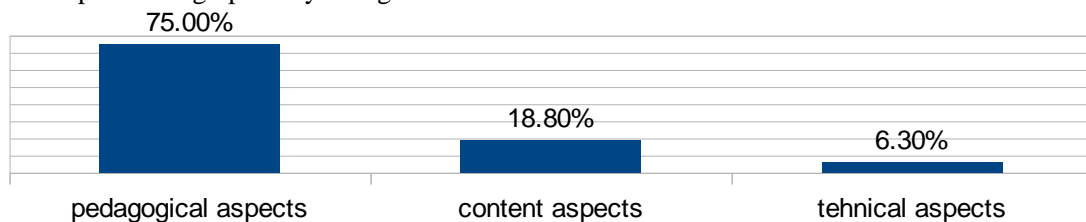


Fig. 1. The aspects that mattered the most during online teaching

The second question of the questionnaire aimed to identify the aspects for which the university professors received support and guidance during online teaching. In Fig. 2 the results are presented, such that 81.30% of the respondent, state that they received support for technical aspects, 12.50% state that they did not receive support and guidance for online activities, and 3.10% of respondents say that they received support for content aspects of the discipline and also 3.10% declare that they received support for

pedagogical aspects.

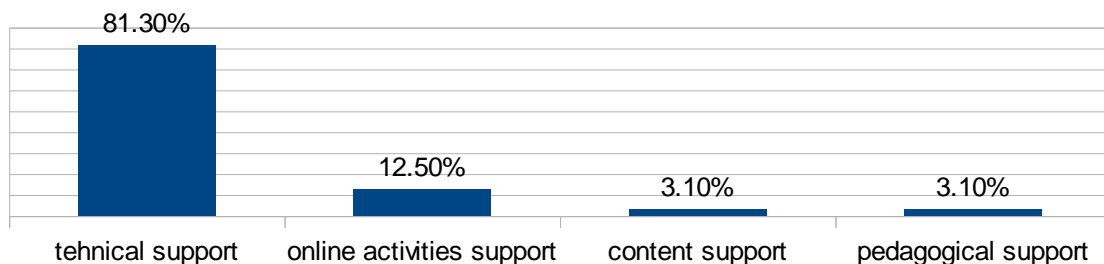


Fig. 2. The aspects for which the university professors received support and guidance during online teaching

Figure 3. graphically presents the third item of the questionnaire, through which we aimed to identify, who were the providers of support and guidance for university teaching staff. The answers given by 75% of the respondents indicate that the main providers of support and guidance were computer science colleges, then in proportion of 68.80% colleges of other specializations and in proportion of only 6.30% public governmental institutions are indicated. NGOs and private companies were not mentioned at all as providers of support and guidance during the online teaching.

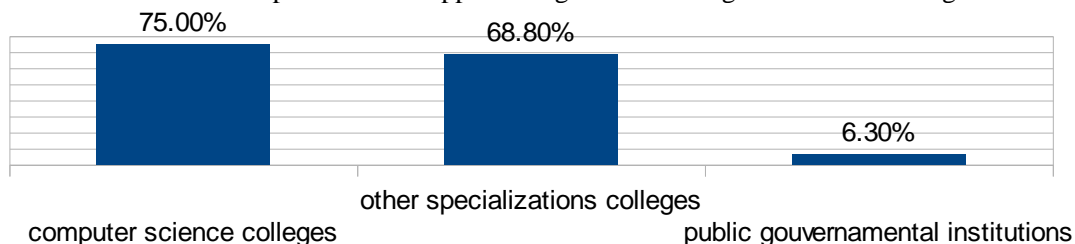


Fig. 3. Providers of support and guidance for university teaching staff

Through the fourth question of the questionnaire, we were interested in finding out which educational online teaching platforms were used by university teachers. We identified the fact that 100% of the surveyed university professors used Microsoft Teams in online teaching, 28.10% used Zoom in teaching, 9.40% used Google Drive, 9.40% also used UMS, and only 3.10% taught online on Google Classroom. Other online teaching platforms, indicated by only 3.10%, were Cisco Netacademy and Fusion 360. The results are shown in Fig. 4.

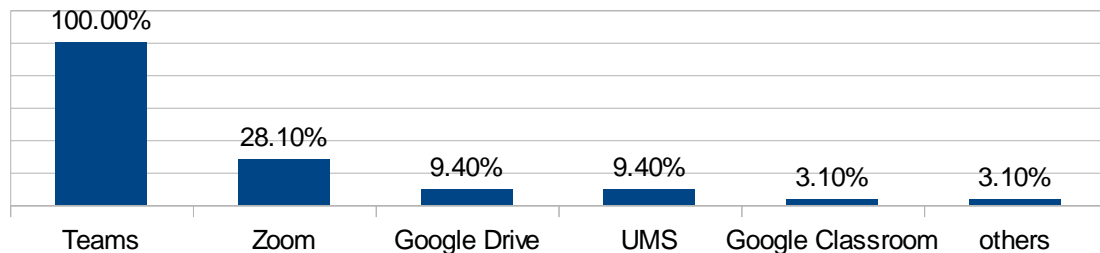


Fig. 4. Online teaching educational platforms were used by university teaching staff

The fifth question of the questionnaire, represented graphically in Fig. 5., sought to identify the causes of the difficulties faced by teachers in carrying out online teaching activities. The most frequent reason indicated by 32% of the respondents, concerned the limits related to the subject matter specifics, respectively the learning activity of the taught subject. Another reason indicated by 28.10% is the lack of suitable tools for class management, as well as for feedback and evaluation. Also with 28.10%, the lack of pedagogical support for the realization of sufficiently effective and/or attractive learning activities was indicated. 25% of the respondents indicated the technical aspects as a difficulty, and 21.90% mentioned as difficult to manage the lack of time necessary for the understanding and proper use of digital tools and resources, while 18.80% of the teachers indicated the lack of a sufficient device as a difficulty performing. Also, 15.60% mention as a difficulty, the lack of suitable tools for online teaching-learning-evaluation, in the subject matter taught and also 15.60% present the lack of motivation as a difficulty in online teaching, while 6.30% of the university teachers choose to mention other two difficulties, namely: the insufficient level of own digital skills and the lack of educational content/digital resources in the field of discipline.

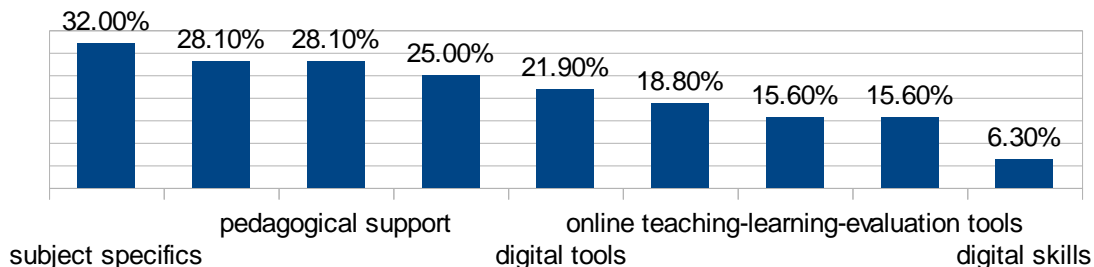
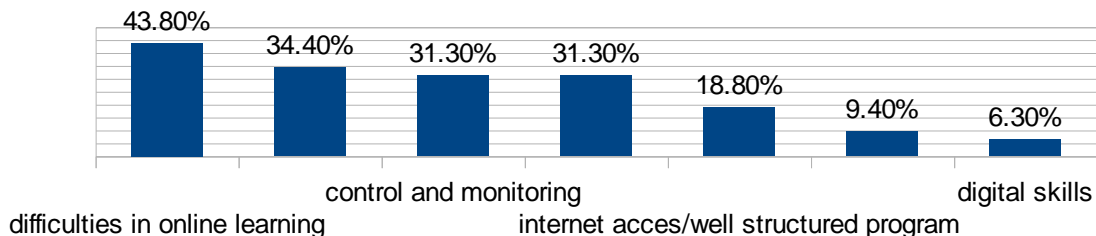


Fig. 5. The causes of difficulties faced by teachers in carrying out online teaching activities

Through the sixth question of the questionnaire, graphically represented in Fig. 6., we set out to identify the causes of the difficulties encountered by students in online learning activities. With 43.80%, the lack of habit of learning with the help of new technologies was indicated, followed by 34.40% of causes related to non-performing devices, then with 31.30%, the lack of constant control and monitoring of their activity

is indicated as the cause of the difficulties encountered of students. Technical difficulties are also mentioned by 31.30%, another reason mentioned only by 18.80% is represented by limited access to the Internet and also to the same extent the lack of a well-structured program is indicated as a difficulty that has caused syncope in learning. With only 9.40%, the lack of sufficiently diversified educational content is mentioned and finally with



6.30% of the answers, the insufficient level of digital skills of teaching staff is indicated.

Fig. 6. The causes of difficulties encountered by students in online learning activities

The seventh question of the questionnaire aimed to identify the most frequent statements, valid for both students and university teaching staff, in the context of supporting online teaching-learning activities. The most frequently chosen statement, considered valid for most teaching staff, 75%, consists in the fact that they intend to continue using (some of) digital tools and resources in their face-to-face teaching activity. Then with a frequency of 71.90% the responding teaching staff indicated as valid for online teaching, the statement according to which teachers work more than usual, followed by 56.30% of the statement according to which the use of new technologies in the learning activity causes teachers to rethink the process didactic. With 46.90% is mentioned the statement that aims at the fact that the digital skills acquired by teachers during this period are useful acquisitions for the didactic activity. Equally with 40.60%, two valid statements for teachers and students are indicated, namely: my students like to learn the use of digital tools and resources, respectively my students manage to a good extent to work autonomously. For 34.40% of the respondents, the statement is valid according to which the suspension of face-to-face teaching activities negatively affects the learning process, and for 25% of the teachers, the statement is valid, which aims at the fact that the lack of human contact can be compensated by well-designed remote activities, while 21.90% consider valid the fact that the period of suspension of face-to-face courses allows teachers and students to concentrate on the essentials, on quality. With 18.80%, two statements are indicated by the teachers, namely that in the current situation supporting the motivation for learning depends exclusively on the teaching staff and the other according to which technical difficulties divert the meaning of learning activities. Finally, with 12.50%, the teachers consider two other statements valid, which highlight: that in the current situation, students can no longer be determined to learn, as well as the fact that too many applications and platforms confuse students. The answers are represented graphically in Fig. 7.

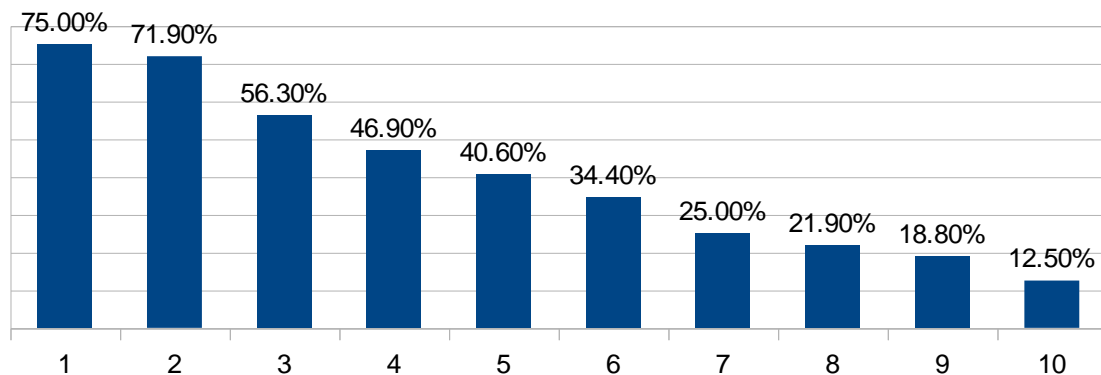


Fig. 7. Statements, valid for both students and university teaching staff, in the context of supporting online teaching-learning activities

The eighth item of the questionnaire aims to identify the extent to which, during the online learning period, students with good and very good academic results, respectively with average results and those with poor results, managed to complete the mandatory contents, according to the discipline sheets. Thus, according to the surveyed teaching staff, we found out that 56.30% of students with good and very good academic results, manage to complete the contents of the course sheets, while 34.40% of students with good and very good results succeed in great measure to study the didactic contents. Only 6.30% and 3.10%, respectively, managed to a small extent or not at all to study the contents of the discipline sheet, as can be seen in Fig. 8 a.

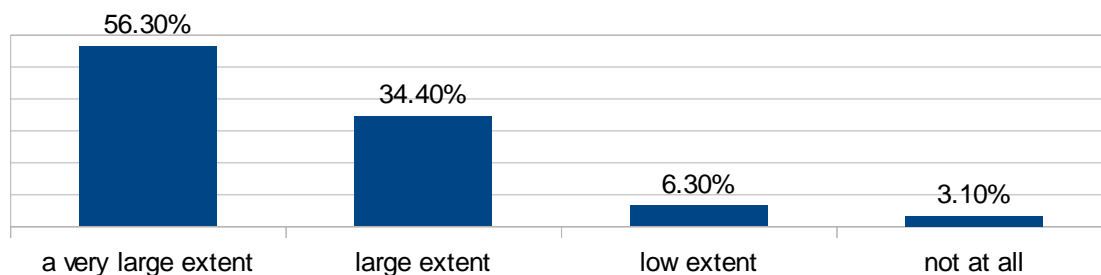


Fig. 8 a. The extent to which, during the online learning period, the students with good and very good academic results, managed to complete the mandatory contents, according to the discipline sheets

Regarding the second category, represented graphically in Fig. 8b., which targets students with average academic results, we learn from the questioned teachers, the fact that only 15.60% of their students succeed to a very large extent in going through the

contents of the discipline sheet, while 53.10% of the students succeed in this to a large extent, and 28.10% of the students manage to a small extent to complete the didactic content. Only 3.10% of students do not manage to pass the subject at all.

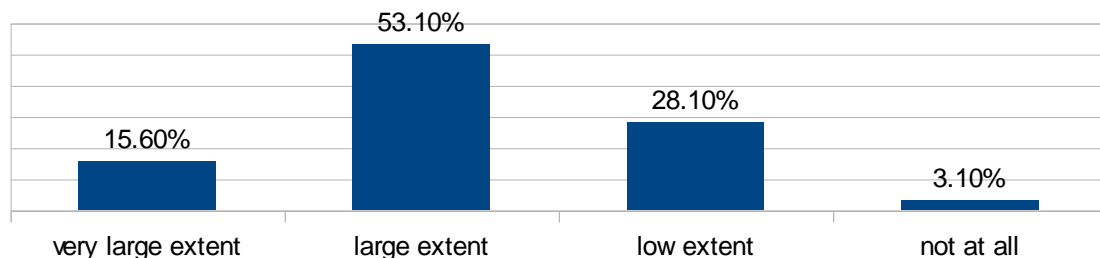


Fig. 8b. The extent to which, during the online learning period, the students with average school results, managed to complete the mandatory contents, according to the discipline sheets

Regarding the third category, students with poor academic results, we learned from the responding teachers that only 9.40% of their students managed to a large extent to complete the provided contents, and 12.50% managed to a large extent to complete the contents of the discipline sheet. Also, 56.30% of the teachers say that the students with poor results managed to a small extent to complete the didactic content, and 21.90% say that the students did not manage to complete the assignments from the subject sheet at all, as can be seen from Fig. 8c.

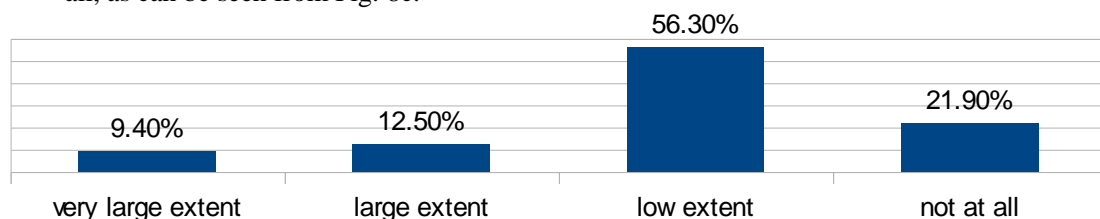


Fig. 8c. The extent to which, during the online learning period, students with poor school results, managed to complete the mandatory contents, according to the discipline sheets

The penultimate question of the questionnaire asked the teachers to indicate by multiple answers, what exactly from the usual didactic activity (face to face), they consider that could not be done online, at a distance and had a negative impact on the thorough learning of the students. The answers given by the 32 university teaching staff highlight the following: 84.40% of the research subjects believe that authentic communication and human relations were affected, followed by the answer indicated by 43.80% of the teachers, who mention that there was a lack of feedback for prompt correction or to confirm purchases. With 31.30% it is indicated that individual counseling is affected, then with 28.10% the teachers consider that the personalized support for

students with special learning needs is affected, followed by 21.90% by monitoring the pace of learning and then with 12.50% it is considered that the explanations for understanding the concepts. Other aspects carried out and mentioned by the teachers with only 3.10% were: objective and carefully supervised assessment, the training of essential practical skills in the field of engineering, the acquisition and development of students' practical skills in technical subjects, the demonstration. Fig. 9. presents these results.

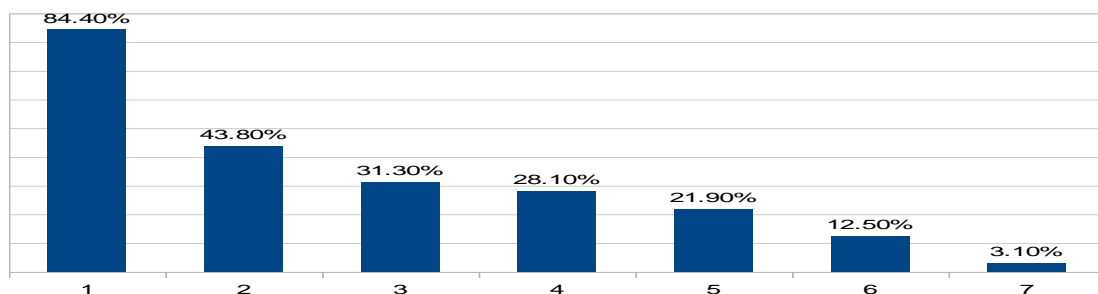


Fig. 9. Aspects of the usual didactic activity (face to face), which the teachers consider that they could not do online

The last question of the questionnaire aimed to share some of the most effective actions, which the teachers undertook during the online teaching period, to motivate the students. Two research subjects did not provide answers, and the other 30 each provided an answer of their own.

Being a subjective topic, we present below the answers provided by the teachers: interesting content of the courses, practical activities carried out face to face; group projects, PPTs and logical schemes; periodical homework and exercise books and supports focused on applications and analyses; readjustment of didactic contents to online teaching methods; presenting new and interesting concepts to capture students' interest; shorter lectures with breaks based on debates; courses and seminars based on discussion; offering points based on involvement; homework with a deadline of delivery and presentation of your choice; videos, courses available to students and discussions on their behalf; diversification of examples with visual and audio sources, evaluation with argumentation; using the messaging service of the platform for consultations related to the taught subject; focus on case studies; personal discussions on Teams with each student and direct encouragement; offering additional video and audio materials to establish a connection with the contents of the course support; continuous evaluation; appointing each student to answer the given tasks; the use of problem solving combined with learning through discovery, the use of simulators, checks along the way and contests; quizzes solved together; self-evaluation; simulations and case studies from practice; online communication, teamwork; additional points for active students; projects made online; individual reflection; quick grid tests, mandatory assignments for each laboratory; stars for active students who count for the grade; team projects; reversal of student-teacher roles during practical laboratory activities and videos.

6. Conclusions

Starting from the ascertainment research carried out by us, we formulated the following conclusions, which we present below. Pedagogical design aspects mattered the most during the online teaching period, and for the technical aspects the most support was given to university teaching staff. In the same vein, the computer science colleagues were the main providers of support and guidance for the teachers, during the online

teaching period. Microsoft Teams was also indicated as the educational platform most frequently used by the majority of teachers. The main causes of the difficulties experienced by university teachers in carrying out online didactic activities were related to the specifics of the discipline taught, the lack of class management tools, the provision of feedback and the achievement of evaluation. And the main difficulties encountered by students, during the online learning period, concerned the use of technology as well as the lack of non-performing devices.

In another vein, university teaching staff consider the continued use of digital tools and resources in face-to-face activities to be important and helpful. Regarding the completion of the contents included in the course sheets, a large part of the students with good and very good academic results managed to complete them to a very large extent, while the students with poor academic results completed the didactic contents to a very small extent. Authentic communication and human relationship represent the aspects that university teachers consider to be the most affected during the online teaching period. In order to motivate students to learn in the online didactic activities, university teachers have used interactive teaching methods, audio-video teaching aids and rewards based on points, stars, etc.

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