

ONLINE TEACHING OF GRAPHIC COURSES IN THE PANDEMIC

Abstract: *The paper highlights certain aspects regarding the online teaching of graphic courses for the students of the 1st year of the Faculty of Machine Manufacturing and Industrial Management, during the COVID 19 pandemic. One can see the premises and the statistically processed results of certain tests of technical drawing with physical and online teaching for the students of the above mentioned faculty, their perceptions and opinions regarding online and hybrid education.*

The conclusions refer to the improvement of online teaching methods for graphic courses and to the role of Pedagogy which cannot be replaced by the technological evolution.

Key words: *distance teaching, online teaching, pandemic.*

1. INTRODUCTION

The state of emergency decreed under the threat of COVID-19 on the 16th of March 2020 has imposed moving the classes online at an unprecedented scale and speed in Romania. Throughout the world this thing has happened before: natural disasters, such as the earthquake in Christchurch and the flooding in New Orleans, the political regime change in Hong Kong, in South Africa and wars have imposed online teaching.

Distance teaching, learning and evaluation had as main objective the temporary access to training and informatics support for a fast, accessible and reliable communication during the pandemic [1].

Replacing the state of emergency with the state of alert has allowed introducing the hybrid teaching system. After ending the state of alert, on 08.03.2022, the full-time education was reintroduced, being the only one enacted for normal conditions, fact which led to a new disturbance of the educational system.

During the two years of pandemic, the distance teaching and hybrid systems have proven their advantages. We consider the will of both teachers and students to preserve the advantages of using informatics platforms and technology for online teaching to be justified. But this legitimate wish will not be able to be fulfilled in the near future.

Returning, under normal circumstances, to online or hybrid systems will be possible only after several phases which require time and bureaucracy: modifying the Educational Law which would include the necessary provisions, elaborating standards by ARACIS (Romanian Agency for Quality Assurance in Higher Education) and evaluating universities.

This article analyses certain advantages and limits of online teaching of graphic courses at the Faculty of Machine Manufacturing and Industrial Management of Iași.

The opinions regarding teaching in the pandemic of students of the first and last classes were taken into consideration. Certain objective, emotional, general and particular difficulties were outlined. One can see graphs which outline students' perceptions and a comparison to other preliminary studies.

2. TEACHING OF GRAPHIC COURSES AFTER MOVING ONLINE

The COVID-19 threat has brought some unique challenges for the higher education institutions. All involved parties (students, professors, technical personnel) have made special efforts to continue the teaching process.

Pausing on-site classes was a moment of repositioning towards the personal discipline. We have left certain routines and we have redefined expectations by noticing the results, motivation and autonomy in learning of students.

The amount of work was enormous, the digital abilities and skills were rapidly improved, and we have learned to use new platforms and created new useful educational resources. Unlike an online university class which is elaborated during 6 – 9 months and which can be considered of an optimal quality after two or three iterations, the first online classes were made between a day and several weeks.

In the beginning of the pandemic, technology had a central position (57%) in the didactic activity, exceeding by far the pedagogical preoccupations (38%), [2]. Now, at the end of the 5th wave of the pandemic, the perspective has modified: a quality didactic activity is centered on pedagogy (60%) and less on technology (36%). This is a signal that, in appreciating the efficiency of education, the stimulation of interactivity, reinforcing the learning motivation, the emotional support and the adequate evaluation tools come first.

The biggest problems in realizing online didactic activities by teachers were: high stress level (psychological, social, technical), the lack of guidance for online activities, not enough time, the lack of a powerful enough computer, the lack of a personal space adequate for didactic activities, the distress of online monitoring in exams. Some of these problems were not solved throughout the two years of pandemic.

The path from the transfer of information to learning was very difficult. There were challenging situations in which one had to remain calm, balanced and optimistic in health insecurity circumstances, for an unknown period of time.

A sense of fellowship and support increased between the members of the teaching department and the connection between professors and students became stronger.

Using the platforms Google, Microsoft Teams, ZOOM was a lifesaver, although difficult moments still existed (the Google platform limited, without notice, the number of participants in a conference). Hastily chosen technologies did not pass through normal selection processes and have the tendency to remain, although there are other opportunities as well.

At the Faculty of Machine Manufacturing and Industrial Management of Iasi, the Descriptive Geometry and Technical Drawing class is taught to 1st year students, for two semesters. Usually, the classes are made of lectures and classical seminars with the step-by-step presentation of drawing phases, the students drawing on paper, with specific tools.

Moving the classes in online in March 2020 imposed a quick fix for some of the difficulties mentioned above and some others specific to graphic disciplines.

In order for the courses and seminars to continue, one had to use platforms ZOOM, Google, MS Teams, AutoCAD and institutional e-mail.

The used strategies were limited by the size of student groups, fact which made interaction and feedback quite difficult.

Supplementing classes with videos, examples and solutions for the suggested theme was helpful. Access to posted materials was not limited in time, fact appreciated by the students who could have access to them according to their own program, fact confirmed in [2].

Students took pictures of their homework and afterwards it was corrected without a direct student-professor contact.

3. ASPECTS OF THE STUDENT ACTIVITY AFTER MOVING CLASSES ONLINE

The 2019-2020 class is the one which felt the most the impact of moving the classes online. From the point of view of graphic disciplines, it was very important that the first semester took place under normal circumstances and that the working method was known.

The main difficulties for the students were: technical difficulties, not knowing the new technologies, lack of digital skills, unorganized program, lack of a proper space for online learning.

Students' emotional difficulties were significantly greater than the educational ones. Home learning, which seemed comfortable and desirable in the beginning, led to increased anxiety, sadness, boredom, the beginning for depression.

The lack of direct interaction, the need of belonging and connection, the lack of coherent information regarding the virus had significant negative effects.

The fact that the emotional links to the colleagues and professors were already increased in the face-to-face semester was an important psychological support. There was a professor-student communication and we openly discussed about anxiety, poor online circumstances, uncertainty for the fate of the parents working abroad,

the total loneliness of some students in lockdown, the lack of perspective of exiting the pandemic.

The life of some students was strongly disturbed and they had to deal with problems which made them not to think of school as their priority.

In the attempt of underlining the impact of moving the classes online on the 2019-2020 class, we have analyzed the learning curve for four consecutive tests and have compared the grades of students in 1st and 2nd semester, thus resulting the graphic from Figure 1.

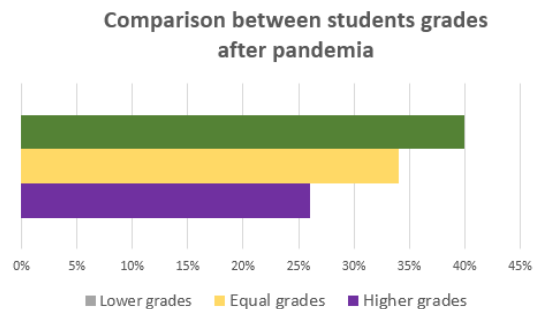


Figure 1 Comparison between students grades after pandemic.

One can notice the large number of students, who have abandoned studies after the outbreak of the pandemic, due to the difficulties mentioned above. The students who had bad results were the most vulnerable, the materials presented online being more difficult to learn taking into account that the teacher does not facilitate their understanding (Figure 2).

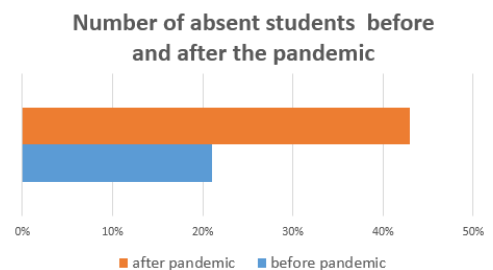


Figure 2 Comparison between percentages of absent students before and after the pandemic.

The current class of 2021-2022 started online the faculty studies, being deprived of many of the joys and opportunities of their age: knowing each other, teamwork, involvement stimulation, collegiality. The lack of certain clear rules for online school and the habit of interacting with the others through a screen, made students more distant towards the professors and the other ones, more detached of school.

On the other hand, having the 12th grade studies made online, this class is much more used to the pandemic way of learning.

The success of these experiences is different, according to the perspective: from the teachers' point of view, the learning results are the most important. Did the students manage to obtain good grades; do they have the required knowledge and skills? From the students' point of view, the main problems are the interest, the

immediate usability of acquired knowledge, the motivation and involvement.

Moving to the hybrid learning allowed the current class to appreciate both the normal teaching, as well as the online one and we were interested in their perception on the learning experience in three different systems: face-to-face, online and hybrid.

In order to know their opinions, we have made an anonymous questionnaire to which all present students of the 1st year responded, numbering 79. They have filled in an anonymous survey with 28 questions on the amount of work, comparison to traditional lectures, the favorite type of class, the quality of online materials, etc. and improvement suggestions which could be implemented in the future.

Figure 3 shows percentages of students' appreciation of online education. There is a high percentage of those who consider it worse than face-to-face education.

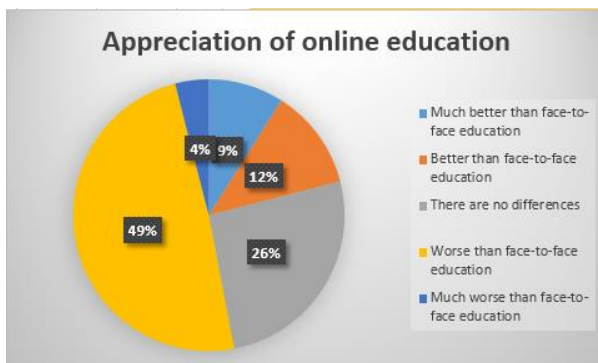


Figure 3 Percentages of appreciation of online education.

The answers of the students regarding their presence in the online classes are shown in the Figure 4. Almost a quarter of them have a low or very low attendance at classes.

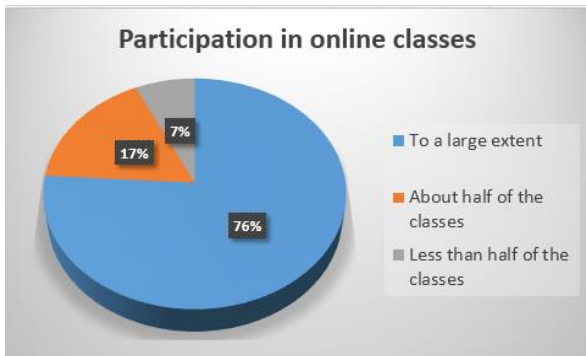


Figure 4 Percentage of participation in online classes.

At the question if, in online education, there were any lack of information in knowledge, half of the students answered in the affirmative (Figure 5).

A high percentage (44%) of students appreciate that their online focus level is lower and 34% considered it's the same.

Most students (86%) consider that their level of online understanding in online is much lower and lower.

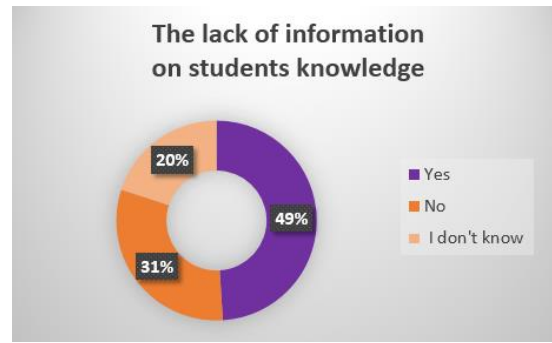


Figure 5 Percentages about the lack of information on students' knowledge.

One of the objectives of this study is to know the expectations of students about future courses. Most students want a hybrid education, with more face-to-face courses (56%) and 30% want more online courses (Figure 6).

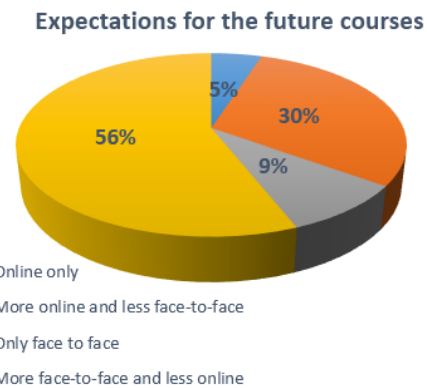


Figure 6 Percentages of student expectations in future courses.

Also, we have planned to outline the difference between the results of the onsite teaching classes and the online ones. For this, we have split the 1st year students into two halves, for one half teaching the class in a traditional way, and for the other half, in the online way. After the class, whose subject was representing tolerance values on technical drawings, the students had to take a test, under the same circumstances.

Figure 7 shows the distribution of grades for students whose course was online, low grades are predominant.

Distribution of grades

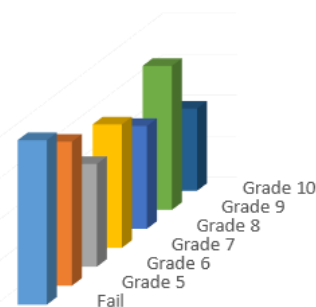


Figure 7 Grades distribution for students whose course was online.

Figure 8 shows the grades distribution for students whose course was face-to-face, high grades are predominant.

Distribution of grades

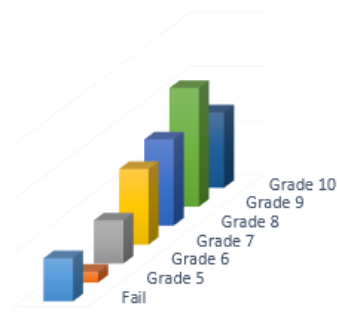


Figure 8 Grades distribution for students whose course was face-to-face.

The students' answers to the other questions of the survey show that the current class has fewer difficulties with Internet access, 49% of them having some problems and only 1% big problems.

The students are more used to the online teaching technologies from high-school: 65% knew them to a great extent, 27% sufficiently and only 8% did not know them.

The online study conditions are better: 27% are alone in their room, 68% are sharing the room with colleagues who do not interrupt them and only 5% do not have good conditions.

Time organization for online learning was: 28% good, 55% relatively good and 7% bad.

Under these circumstances, generally good, the students' participation in online classes is reflected in Figure 4. Among the 1st year students, the percentage of the ones who have at least one failed exam is close to the percentage of the previous years.

The students mainly appreciated the quality of materials as being a good one, considering it to be clear and well structured. The biggest problem was to find themselves the drawing phases. They concluded that they need supplementary consultations to prepare the colloquy.

The adaptability and the maturity of the new student class are remarkable: 76% of them appreciate that the exam session was according to their expectations; 19% consider that it was easier and only 5% that it was the hardest.

The results presented above have been compared to those from study [2], based on the answers given by 238 students of Engineering sciences from all around the world: 43% Europeans, 47% North Americans and 10% Asians. According to this study, more than half (59%) have evaluated online classes as being worse or much worse than on-site classes, compared to 53% in Figure 3.

Many of the conclusions of studies [2], [3] are similar to the ones presented in this article, referring to: level of focus and understanding, learning conditions, access to technology, digital skills.

Approximately three quarters of the respondents of the study [2] have declared that the amount of online homework is larger or much larger. This thing does not apply for the current class, who finds them similar.

4. CONCLUSIONS

The study of the impact that the sudden, repeated movement of face-to-face classes online and vice versa has on teaching, learning and academic evaluation is only at the beginning, but very necessary. It is quite probable that in the future there will be similar situations, connected to public health and safety, thus online teaching must become part of the didactic process.

The results of surveys and tests presented in this article are confirmed through the corroboration with the results of similar surveys and one of the essential conclusions is that, although responding students appreciate the advantages of online education, they are not sure that it is similar to traditional education, from the quality point of view. Although important, the role of technology is complementary to pedagogy, which cannot replace in efficiency, creativity stimulation, strengthening the learning motivation and emotional support.

Another general conclusion is that the students' evaluation after moving the classes online was very much affected by the crisis context and the moving emergency.

In order to answer the needs of students, the universities of Romania will have to rethink their educational services offer, to improve the communication with them, to offer a teaching program adapted to the online and, especially, to prepare online classes, considering the specificities of this organization and communication environment.

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