# Opportunities for the development of students' skills and creativity during the pandemic

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**Abstract.** The coronavirus pandemic had a major impact on higher education by forcing the universities to go online. Despite many disadvantages in terms of socialization, face-to-face interaction, attention, and mental health, online teaching and learning provide many opportunities in terms of time management and personal development. This research is exploring the opportunities for the development of students' skills and creativity during the pandemic. A research model has been developed that analyzes the relationships between the quality of teaching, the quality of online activities, the stimulation of communication with the teacher and other students, and the opportunities for personal development. The model testing results show that the quality of online activities, measured in terms of stimulation, motivation, and attractivity, is the main predictor of the opportunities for skills and creativity development.

## 1. Introduction

The coronavirus pandemic is affecting all aspects of human life for more than two years. The constraints imposed by the emergency had a major impact on education by forcing the universities to go online. As many studies showed, distance education has many disadvantages, such as lack of interaction with the teacher, increased workload, concentration difficulties, boredom, and fatigue (Aguilera-Hermida, 2020; Coman et al., 2020; Gaikwad & Kulkarni, 2021; Lamanauskas & Makaraskaite-Petkevitciene, 2021; Manea et al., 2020; Korolkov et al., 2020). Stevanovic et al. (2021) appreciate that it is much

more difficult for the teacher to observe the differences between the students and to anticipate their needs. However, according to the authors, the biggest disadvantage is related to assessment (problems with the choice of subjects, the possibility of cheating, low motivation for learning, anxiety, technical problems, and insufficient digital literacy).

Nevertheless, distance education is also a challenge for universities that creates several opportunities for the development of teaching and learning skills, including the development of digital skills and gathering self-efficacy in teaching and learning, opportunities for innovations and developments, collaboration, and building partnerships with different Universities, and for increasing the quality of education or preventing the early school dropout (Dhawan, 2020; Santi et al., 2020; Wong, 2020; Mogaji & Jain, 2020; Oliveira, 2018).

Cambridge dictionary defines the *skill* as "an ability to do an activity or job well, especially because you have practiced it", and creativity as "the ability to produce or use original and unusual ideas". The American dictionary defines *skill* as "a special ability to do something" and creativity as "the ability to produce original and unusual ideas, or to make something new or imaginative".

The term *creativity* was introduced into Psychology by G.W. Allport, to designate a personality formation. M. Roco (2004) appreciates that creativity presupposes productivity, utility, efficiency, value, novelty, ingenuity, originality, the defining factors for *creation* being novelty and originality.

Creativity is a complex, dynamic phenomenon, which involves the bio-psycho-social and cultural structure of the personality, but also certain external factors, to achieve "the highest form of manifestation of human behavior, completed by producing the new with social value" (Stoica-Constantin, 2004).

A. Maslow (1954, 1971) and C. Rogers (1959, 1961) - representatives of Humanistic Psychology - associate creativity with the concept of "self-actualization" (according to Stoica-Constantin, 2004), fulfillment of personal potential; creativity is also seen as the ability to imagine unique and original solutions to problems (Mumford et al, 1994; Lumsdaine & Lumsdaine, 1995).

In the field of education, creativity is seen as a key skill, which must be developed at students with positive effects on school performance, improves the students' well-being, increases commitment to learning, being important during life, for personal and professional development (Lucas & Spencer, 2020). As specific features of creative thinking, Lucas & Spencer (2020)

propose the "five-dimensional model", which integrates five elements: curiosity, tenacity/perseverance, collaboration, discipline, imagination. Sternberg & Lubart (1991) sustain a theory that comprises 6 resources for creativity: intellectual processes, knowledge, intellectual style, personality, motivation, and environmental context; those elements converge in *creative performance*.

The objective of this paper is to analyze the perceptions of Romanian students as regards the quality of online activities, quality of teaching, as well as their impact on communication and opportunities for creativity and skills development. To do this, a model has been developed and tested on a sample of 326 university students from the Valahia University of Targoviste.

The rest of the paper is organized as follows. The next section presents the model conceptualization. In section 3, the method and model testing results are presented and discussed. The paper ends with a conclusion in section 4.

## 2. Model conceptualization

### 2.1 Theoretical background

The P21 learning framework (P21, 2009) highlights three types of skills needed in the 21st Century: life & career skills, learning & innovation skills, and information, media, and technology skills. Learning and innovation skills are represented by critical thinking & problem solving, creativity & innovation, and communication & collaboration (Trilling & Fadel, 2009).

Although the pandemic brought many constraints to education, it also created new opportunities. As Dhawan (2020) pointed out, students could learn anytime and anywhere, leading to the development of new skills for life-long learning. His SWOC analysis of online learning during the pandemic mentions the opportunities for strengthening skills related to problem-solving, critical thinking, and adaptability.

Sharma et al. (2021) carried out a survey at Chitwan Medical College Bharatpur (N=443) to analyze the satisfaction towards online learning. Their study found out that the main predictors of satisfaction were the learner's characteristics, especially technological support and skills, time flexibility, teachers' performance, interaction with the instructors, and quality of the e-content.

During the pandemic period, many studies have focused on identifying the factors that influence the efficiency of the educational process in the online environment, as well as on the satisfaction of the beneficiaries (students). Tan, Chuah & Ting (2016) focus on the examination of internal and external factors that influence students' level of satisfaction towards online learning systems: self-efficacy and self-motivation - as internal factors, and interaction - as an external factor. In their study, Abuhassna et al. (2020) show that satisfaction towards online learning depends on the students' background, experience, collaborations, interactions, and autonomy.

In another study, the students' satisfaction related to online learning was positively linked to student-instructor interactions, teacher presence, self-management of learning, and academic self-efficacy (Um & Jang, 2021). They also found that students' satisfaction with online learning is an important factor in their intention for continuing to use online learning. Muthugamage & Galhena (2021) show that student satisfaction in online learning is positively correlated with the quality of the online learning system (relevance, timeliness, and information accuracy).

Law (2021) argued that creativity in pedagogy during the pandemic requires new views on creativity and its development. In his view, creativity is related to individual and collaborative efforts, should focus on actions (rather than on a product or standard), and encompass verbs like build, adapt, improvise, make, and co-create. At the same time, students are not so happy when playing a passive role in the process of acquiring new knowledge. They are ready to be actively involved in didactic approaches, with the view to explore their creativity and inventiveness (Santi & Gorghiu, 2019).

The study of Triana & Nugroho (2021) analyzed several aspects related to students' personal development during the pandemic. They found that the online platform provides options that enable teachers to be creative and find ways to make students think creatively.

During this period, schools and universities sought to generate students' satisfaction with online education, while combating anxiety/isolation and ensuring mental well-being. The impact of the Covid pandemic on the psychological level, individually, has contributed to the exploration of new roles and activities that can bring physical and spiritual well-being. In this respect, accepting the "new normal" and adapting to the changes generated by the pandemic context, opportunities for self-knowledge and personal development have been exploited, to change the vision related to the near future in terms of training and employment on a dynamic labor market.

## 2.2 Research model and hypotheses

In this study, the quality of online teaching - as perceived by students - refers to the suitability of methods, the adaptation of content to online presentation, and the adaptation of assignments to online learning. Teachers should maintain a continuous dialogue with students and find ways to stimulate collaboration and communication between students, by promoting collaborative learning tasks (Alawamleh et al., 2020; Zarzycka et al., 2021). The teaching quality impacts the quality of all online activities, including seminars, projects, group work, and individual study. Teachers should adapt their teaching methods to make online courses attractive, motivating, and stimulating students' interests (Dhawan, 2020; Lasang et al., 2021). Therefore, we hypothesized that:

> *H1. Quality of teaching has a positive effect on communication (QT $\rightarrow$ COM).*
> *H2. Quality of teaching has a positive effect on the quality of online activities (QT $\rightarrow$ QA).*

Interacting with the teacher and with other students represents a very important issue during the pandemic when students are isolated and learn from home (Dhawan, 2020; Um & Jang, 2021). Therefore, communication is a key factor for keeping online activities interactive and motivating (Berwell et al., 2019; Alawamleh et al., 2020).

> *H3. Communication has a positive effect on the quality of online activities (COM $\rightarrow$ QA).*

Communication with the teacher and colleagues is very important for personal development. First of all, interaction with the teacher and other students has a positive effect on the learning experience which leads to the development of online learning skills (Roper, 2007; Dhawan, 2020). On the one hand, teachers could challenge students to be creative and develop new skills that are specific to the discipline they teach. Group work during collaborative projects leads to particular skills and improves creativity through a knowledge-sharing process (Paulus, Dzindolet, & Kohn, 2012; Rasheed, 2020). Therefore,

> *H4. Communication has a positive effect on the opportunities for personal development (COM → PD).*

Students need a stimulating learning context since only the delivery of the content is not enough for skills development (Backzek et al., 2021). Online activities that are interactive, attractive, and motivating, provide opportunities for improving students' skills and creativity (Hartman, 2001).

> *H5. The quality of online activities has a positive effect on the opportunities for personal development (QA → PD)*

The research model that includes four factors is presented in Figure 1. The relationships between the factors are illustrated through the aforementioned five hypotheses that are tested in this study.
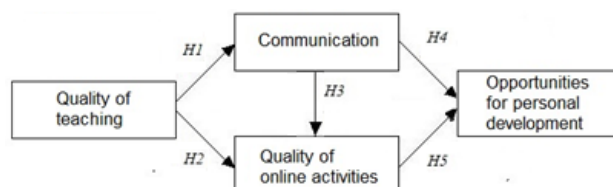


Figure 1. The research model

The operationalization of the constructs is presented in Table 1.

Table 1. Constructs and items

| QT | QT1 | Teaching methods are suitable for online school |
|---|---|---|
|  | QT2 | The content is adapted to online presentation |
|  | QT3 | Students' assignments received are adapted to online learning |
| COM | COM1 | The online school stimulates communication with teachers |
|  | COM2 | The online school stimulates communication with colleagues |
| QA | QA1 | Online activities are attractive |
|  | QA2 | Online activities stimulate the learning motivation |
|  | QA3 | Online activities are interactive |
| PD | PD1 | The online school provides opportunities to improve students' skills |
|  | PD2 | The online school provides opportunities to improve students' creativity |

# 3. Model testing results

## 3.1 Method

The model testing follows the structural equation modeling (SEM) two-steps approach recommended by Anderson & Gerbing (1988): (1) evaluation of the measurement model for validity and reliability then (2) evaluation of the structural model for overall fit and hypotheses testing.

Based on the recommendations from the literature (Hu & Bentler, 1998; Schermelleh-Engel et al., 2003; Hair et al., 2006), the following goodness-of-fit measures were used: chi-square ($\chi^2$), normed chi-square ($\chi^2/df$), comparative fit index (CFI), goodness-of-fit index (GFI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA).

The models were analyzed with Lisrel 9.3 for Windows (Mels, 2006), using the maximum likelihood estimation method.

## 3.2 Model testing results

The evaluation instrument was administrated in the autumn of 2021 to 326 students (154 males/172 females) from the Valahia University of Targoviste. The students have been asked to answer several questions related to demographics (age, gender), and to evaluate several items (on a 5-points Likert scale). Most of the students (175) are in the range 18-25 years old, 30 students are 25-30 years old and 121 students are over 30 years old.

The descriptive statistics, item loadings, and items' reliability are presented in Table 2. All mean values are over the neutral value which means that students have a positive perception of the quality of teaching, communication, quality of online activities, and opportunities for personal development. The lowest rated item (M=3.28) refers to the communication between students. The highest-rated item (M=4.40) refers to the suitability of teaching methods for the online school.

All item loadings are over the threshold of 0.6 and statistically significant (*t*-values > 1.96). The item reliability ($R^2$) values are above the suggested standard of 0.50. The composite reliability (CR) values ranged from 0.833 to 0.933, above the minimum level of 0.70, indicating adequate reliability. The

values of the average variance extracted (AVE) are all above the minimum level of 0.50, ranging from 0.632 to 0.874, confirming the convergent validity of constructs.

Table 2. Descriptive statistics and loadings

| Factor | Alpha | Item | Mean | SD | Loading | $R^2$ |
|---|---|---|---|---|---|---|
| Quality of teaching (QT) | 0.813 | QT1 | 4.40 | 0.86 | 0.79 | 0.62 |
| | | QT2 | 4.39 | 0.94 | 0.86 | 0.74 |
| | | QT3 | 4.30 | 0.98 | 0.79 | 0.62 |
| Communication (COM) | 0.831 | COM1 | 3.74 | 1.28 | 0.89 | 0.79 |
| | | COM2 | 3.28 | 1.47 | 0.91 | 0.66 |
| Quality of online activities (QA) | 0.872 | QA1 | 4.06 | 1.12 | 0.81 | 0.66 |
| | | QA2 | 3.71 | 1.29 | 0.87 | 0.76 |
| | | QA3 | 3.93 | 1.13 | 0.93 | 0.68 |
| Opportunities for personal development (PD) | 0.899 | PD1 | 3.86 | 1.17 | 0.92 | 0.85 |
| | | PD2 | 3.87 | 1.18 | 0.89 | 0.79 |

The reliability of constructs (Cronbach's alpha) is good, ranging from 0.813 to 0.899. The discriminant validity of the model has been examined through the squared correlation test, using the procedure outlined by Fornell and Larcker (1981). The results in Table 3 show that the square root of the AVE is greater than the correlations between constructs (with one very small exception), which is evidence of discriminant validity.

Table 3. Results of convergent and discriminant validity

| | CR | AVE | QT | COM | QA | PD |
|---|---|---|---|---|---|---|
| QT | 0.886 | 0.723 | **0.850** | | | |
| COM | 0.840 | 0.724 | 0.602 | **0.851** | | |
| QA | 0.875 | 0.701 | 0.759 | 0.838 | **0.837** | |
| PD | 0.901 | 0.819 | 0.592 | 0.826 | 0.791 | **0.905** |

Note: The bold diagonal numbers represent the square root of AVE

A structural equation modeling (SEM) approach was carried on to test the fit between the research model and the data. The model testing results are presented in Figure 2.

The fit between the model and the data is very good, as shown by the goodness-of-fit (GOF) indices: $\chi^2$=36.47, df=30, p=0.193, $\chi^2$/df=2.344, CFI=0.997, GFI=0.978, SRMR=0.0188, RMSEA=0.026.

The model testing results show that all hypotheses are supported. Quality of teaching has also a positive influence ($\beta$=0.60, p=000) on the

communication (COM) thus supporting H1. Quality of teaching (QT) has a positive influence (β=0.40, p=0.000) on the quality of online activities (QA), thus supporting H2.

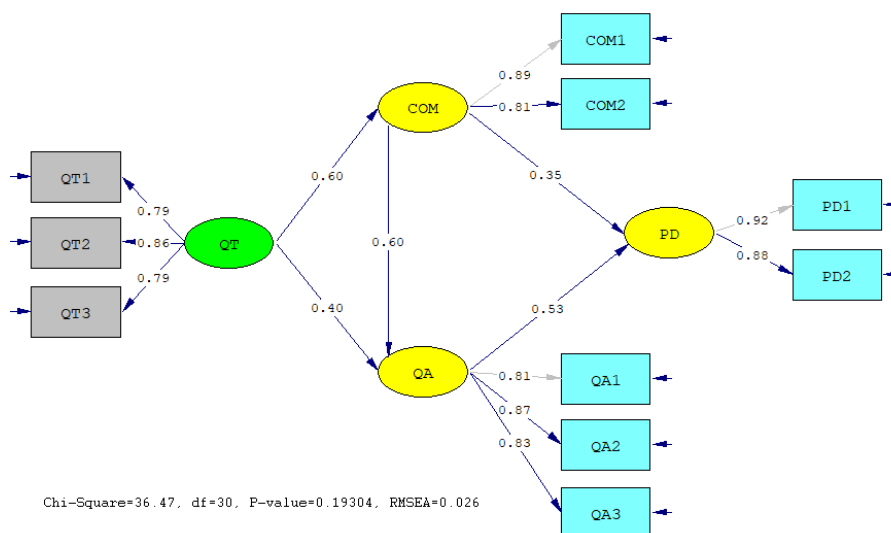

Figure 2. Model estimation results

Communication has a positive influence on both quality of online activities (β=0.60, p=0.000) and the opportunities for personal development (β=0.35, p=0.001) which shows that H3 and H4 are supported. The quality of online activities has a positive influence (β=0.53, p=0.000) on the opportunities for personal development (PD), thus supporting H5.

Apart from the direct effects, QT has also an indirect effect on QA (mediated by COM) and PD (mediated by COM and QA). COM has both a direct and an indirect effect on PD (mediated by QA). The total and indirect effects are presented in Table 4.

Table 4. Total and indirect effects

|  | QT | COM | QA | PD |
|---|---|---|---|---|
| QT | - |  |  |  |
| COM | 0.60 | - |  |  |
| QA | 0.76 (0.36) | 0.60 | - |  |
| PD | 0.61 (0.61) | 0.67 (0.32) | 0.53 | - |

Note: indirect effects in parentheses

The model explains 35.9% variance in communication, 80.1% in the quality of online activities, and 71.7% in the opportunities for personal development.

## 3.3 Discussion

The results of the study show that the quality of teaching (QT) has a positive effect on communication (COM) - students appreciate that the teaching methods used by their teachers have been adapted to online education, the proposed content has been appropriate, and the topics and projects received have been adapted to online learning. All those elements imply effective didactic communication - the basis for effective learning.

The quality of teaching (QT) has a positive effect on the quality of online activities (QA) - the surveyed students appreciate that online activities are attractive, stimulate motivation for learning, having an interactive character. Thus, the teachers' experience and the quality of the didactic demarche carried out in a traditional format are important indicators of the quality of the didactic act in the online environment. According to them, a good teacher - in the face-to-face format - can efficiently translate the teaching demarche in the online environment, managing to transfer knowledge through appropriate, attractive, and interactive methods, stimulating the students' involvement in teaching and learning, and motivating them by using methods and strategies that arouse the students' cognitive interest. Numerous studies in the field of Science of Education show the importance of capitalizing on active-participatory methods in teaching, in the university environment. Those methods are also effective in the online environment, although the interaction in this context involves more effort on the teacher's part.

Another result of this research shows that communication (COM) has a positive effect on the quality of online activities (QA). The surveyed students appreciate that communication with teachers and colleagues influences the quality of the didactic demarche carried out in the online environment. In education, communication is fundamental: the quality of teaching and learning depends on how the teacher capitalizes the verbal, nonverbal, and para-verbal communication, creates opportunities to develop students' communication skills (written and oral), and provides appropriate feedback. Many recent studies show that teacher feedback is a very important key in learning, both physically and in the online environment. We can appreciate the fact that, due to its limitations, the teaching process carried out in the

online environment depends to a large extent on the feedback provided by teachers to students and also by students to teachers. There can be more communication barriers in the online environment than in the physical format, as the teacher cannot control independent variables such as internet connection, quality, and functionality of devices or platforms that mediate communication, or even students' attitudes (many related to closed cameras).

According to the received answers, students appreciate that communication (COM) has a positive effect on personal development opportunities (PD). The need to adapt to the changes imposed by the pandemic in education has created multiple opportunities for students' personal development: universities and faculties have focused on students' cognitive and emotional needs, applied the principles of the student-centered education paradigm, treating the various mental disorders that students faced: stress, anxiety, depression, isolation, lack of socialization, lack of motivation to learn, tendency to drop out of school, poor results in learning. Many universities have created coaching platforms, involving older students in providing learning support to beginner students; organized workshops and webinars on self-knowledge and personal development to support students and provide them with useful information on physical and mental health during this period; they provided psychological counseling services to vulnerable students, tutoring services and facilitated multi-channel communication with students (educational platforms, emails, WhatsApp groups, messages), creating a sense of cohesion and belonging to the educational group and providing emotional support.

The pandemic has brought opportunities for personal and professional development for teachers as well - many of them have taken courses related to digital skills development, emotional literacy, counseling, to better meet the students' needs during this difficult time. There is also a growing interest in recent research on topics aimed at improving the quality of teaching in the online environment, increasing motivation for learning, the satisfaction of education beneficiaries, mental well-being, etc.

Another result of the research indicates that students appreciate the quality of online activities (QA) as having a positive effect on personal development opportunities (PD). The online educational process has required the development of digital skills in students and teachers, communication skills, self-motivation, time and learning management, emotion and stress management, problem-solving, collaboration and cooperation, self-control,

adaptability, even foreign languages. Many of the lifelong learning skills have found the right development context.

The students' and teachers' creativity became an indispensable factor in the new learning contexts. Unfortunately, not all the students had the opportunity to take advantage of such opportunities, the pandemic also amplified the phenomenon of segregation, lack of material and financial resources, or economic problems - issues that contributed to the increase of the dropout rate.

Pandemic and post-pandemic education are quite different matters, bringing opportunities, but also multiple risks. According to other research, online education can have multiple disadvantages for both students and teachers: stress, fatigue, difficulty in terms of concentration, high workload, lack of interaction, lack of motivation for learning (Aguilera-Hermida, 2020; Coman et al., 2020; Gaikwad & Kulkarni, 2021; Lamanauskas & Makaraskaite-Petkevitciene, 2021; Manea et al. al., 2020; Korolkov et al., 2020). It is also much more difficult for teachers to make a real, authentic connection with students, to observe the differences between them, but also their cognitive or affective needs (Stevanovic et al., 2021), and to evaluate them objectively.

In addition, online education can bring many opportunities for personal and professional development - for students, teachers, and even for educational institutions.

The actual results cannot yet be observed in depth; the cost-benefit analysis that we will carry out in the future regarding the effects of the pandemic in the formation of future generations will reveal results that the school, in general, but also the future society will have to accept and solve.

There are several limitations of an exploratory study. First, the sample of the research has been collected from only one university. Secondly, only four latent variables have been considered in this study and two of these have only two items.

## 4. Conclusion and future work

This study contributes to a better understanding of the factors involved in online education influencing the quality of teaching and learning, and the process of students' personal development, through the opportunities created and facilitated by universities.

The skills needed in the near future - life and career skills, learning and innovation skills, and information, media, and technology skills - require a rethinking of the educational process, emphasizing the paradigm of student-centered education, involving teachers' adaptation, innovation, foresight, the anticipation of the future requirements, training of educators as holistic, autonomous and creative personalities.

Several future jobs or activities are difficult to be designed or even not known, but also the pandemic - considering the rapid evolution of various fields - challenge the educational policies, so that tomorrow's adults must face the provocation of the labor market: adaptability, creativity, communication and collaboration, emotional intelligence, problem-solving and decision-making abilities.

The results show that there are many opportunities for students' skills and creativity development during the pandemic. The quality of teaching is one of the factors that influence the communication between educators and learners, by adapting traditional teaching methods and means to the specifics of the activities carried out in the online environment. Also, the developed teaching skills are an intrinsic condition of the quality of online teaching activities. Effective didactic communication transcends the barriers of the screens and the teachers who know how to use communication and can manage it properly, transfer to students not only knowledge but also values. All those variables exert influence on the students' personalities, creating opportunities for growth at the personal and professional levels.

Exploring all the variables related to online teaching, and also understanding them, are prerequisites for optimizing post-pandemic teaching activities and laying the foundations of an educational system ready for future challenges.

Future research could study the relationship between students' socio-emotional skills and online learning success, or identify the effects of online education on different components of students' personality, as the artificial environment of online education, based on real human interactions, with proper conditions for the holistic development of the learners' personality. Other topics could address the dynamics of self-efficacy or self-image formation in the case of the students who learn in the online environment.

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