

## Article

# Effective Teaching during the COVID-19 Pandemic? Distance Learning and Sustainable Communication in Romania

Laurențiu Petrila <sup>1,2</sup>, Gabriela Goudenhoofft <sup>3</sup>, Beata Fatime Gyarmati <sup>1</sup>, Felix-Angel Popescu <sup>2,4,\*</sup>, Corneliu Simuț <sup>5</sup> and Alina-Carmen Brihan <sup>3</sup>

<sup>1</sup> Doctoral School of Sociology, University of Oradea, 410610 Oradea, Romania; laurentiu.petrila@univagora.ro (L.P.); beata.gyarmati@csud.uoradea.ro (B.F.G.)

<sup>2</sup> Faculty of Juridical and Administrative Sciences, Agora University of Oradea, 410610 Oradea, Romania

<sup>3</sup> Department of Political Sciences and Communication Sciences, Faculty of History, International Relations, Political Sciences and Communication Sciences, University of Oradea, 410610 Oradea, Romania; ggoudenhoofft@uoradea.ro (G.G.); cbrihan@uoradea.ro (A.-C.B.)

<sup>4</sup> Doctoral School of Economic Sciences, University of Oradea, 410610 Oradea, Romania

<sup>5</sup> Department of Historical and Systematic Theology, Faculty of Theology and Religion, University of Pretoria, Pretoria 0028, South Africa; corneliu.simut@up.ac.za

\* Correspondence: felix.popescu@univagora.ro

**Abstract:** Telecommuting in education field, enforced by Romanian Government measures as policy responses to COVID-19 pandemic, has had a tremendous effect both on teaching professionals and on students. This paper investigates the first group, namely the teachers and their perception of online education versus students' academic performance during distance learning, with a particular focus on the negative factors impacting educational activities: objective ones, such as the limits of technology, and personal subjective ones, as in the phenomenon of negative affect. The study is based on quantitative research that assesses the relationship between personal subjective factors (skills, affect, difficulties in adapting, level of preparedness, professional satisfaction) and technological objective factors (inadequate electronic devices, faulty internet services), with a view to establishing if online education is genuinely sustainable as a valid educational system in the long run. 881 teachers from Romania were subjected to reflect on the effectiveness of online education during the pandemic, resulting in a correlational study with some interesting conclusions and directions highlighted as characteristic for a sustainable educational program. All in all, it can be concluded that when teachers become experienced in online teaching, the efficiency of online teaching is set to improve and when improvement happens, online teaching becomes sustainable as a proper method of training via online-facilitated means of communication.

**Keywords:** online education; distance learning; educational services; digital competencies; effectiveness of online education



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## 1. Introduction

Online work is no longer an exceptional social and professional reality, neither globally nor locally, because interpersonal interaction is facilitated by more than merely traditional physical meetings. As such, various activities mediated by specialized online conference platforms were made possible especially after the years 2007 (for Lync), 2011 (for Zoom), 2013 (for Business Skype) and 2017 (for Microsoft Teams). Nevertheless, because of the situation caused by the COVID-19 pandemic, professional activities carried out on the internet or via various online platforms have increased exponentially. Manfuso [1] points out that the COVID-19 pandemic led to a 'tremendous increase in the number of uses that will be using e-learning tools. In turn, online activity in education witnesses a sudden boom almost overnight with extra-work for both educators and students.

Among the factors which precipitated this telecommuting in so many professional contexts, one can include government measures enforced with a view to physical distancing

in the vast majority of the world's countries. Thus, lockdowns across the globe led to a dramatic rethinking of professional activities in most fields of professional work, ranging from the medical system to services and education. The subsequent impact caused by telecommuting was felt throughout the world, as online activities became not only mandatory but also necessary, especially in the field of education. Teachers and students alike were forbidden to meet in person for their usual teaching and learning routine; schools were closed, and the entire range of pedagogical work was transferred online almost overnight. Face-to-face meetings were replaced by online conferences and discussions were now mediated by internet devices. Zheng et al. [2] reveal that this new situation brought to the fore the 'mediating effects' of 'online interaction quality', as well as the impact and sustainability of internet-based education.

This paper investigates the relationship between certain subjective and objective factors characterising the teaching professionals. The focus is on online education and how these factors are associated with the teaching professionals' perceptions of online education and students' academic performance during online learning in the context of whether online learning can be considered sustainable in the future as a valid educational system. In other words, the issue is whether online education can be maintained at a satisfactory level of efficiency within Romania's educational system despite its apparently inherent shortcomings and problems. This is the fundamental aspect which this paper has in view and will attempt to provide an answer to.

The paper has the structure in the following order: Introduction, Literature Review, Hypothesis and Methodology, Results, Discussion.

## 2. Literature Review

The lives of teachers during the COVID-19 pandemic changed drastically and rapidly. Thus, spending a significant number of hours every day in front of various electronic devices (desktops, laptops, tablets, smartphones, etc.) while teaching students led to personal (and even communitarian) fatigue and professional inefficiency. Verestiuc [3] notices that these concrete results were recorded in all fields of human professions and especially in education, where not only students felt exhausted, but also the teachers experienced extreme fatigue. Not only fatigue, as indicated by Popovici et al. [4], but also boredom suddenly became unmanageable, although in a more traditional onsite setting these issues would have been dealt with in an easier way.

For teachers, fatigue and boredom became problematic in the context of the sudden change from onsite to online activities; for instance, interpersonal interaction and communication was severely crippled because of the new mediation provided by specialized devices. Moreover, teachers—and students for that matter—felt uneasy as they interacted for pedagogical purposes. According to Derakhshan et al. [5], Manea et al. [6], this situation appears to have been universal because it was reported in educational contexts across the globe.

Consequently, one of the most problematic aspects of telecommuting from onsite to online teaching was the lack of interpersonal communication, which implies the physical presence of various human beings in the context of a regular meeting room or the site of professional work. Raboca et al. [7] show that teachers no longer felt in control of either themselves and their pedagogical work or their students and their learning processes. Class discussions turned into conference meetings and the naturalness of daily communication was put against the availability of internet-facilitated software, so fatigue and boredom became wide-spread issues for teachers in their new capacity as online pedagogues.

Arifin et al. [8] explain that, as a result of the COVID-19 pandemic, teachers were faced with another problem which was caused by the compulsory character of telecommuting to online education: inadequate electronic devices. Once online activities started as replacement for traditional onsite lessons, it became evident that for a large majority of teachers, the computers, tablets, smartphones and other such electronic devices not only they were inadequate for the kind of services they were supposed to provide but they also caused

students to display low motivation for online learning. In other words, not every teacher owned or had access to the latest model of such electronic devices which were supposed to facilitate online education for students. Older electronic devices were thus technically incapable of facilitating online connections within normal parameters, which obviously hindered the transmission of information through these channels. One would expect such problems to be prevalent in rural areas, but urban centres were not exempted from such technical issues and the situation in cities was not necessarily far better than in villages. Makuna et al. [9], as well as Kaisara et al. [10], highlight that online education during the COVID-19 pandemic was problematic because of the various issues caused by internet devices. What happened because of the inadequacy of electronic devices, Verestiuc [3] opines, was that pedagogical activities were blocked for longer periods of time, which resulted in poor educational services rendered to all categories of students.

Thus, while online activities themselves generated fatigue and boredom, the inadequacy of electronic devices made things far worse; their absence or their technological shortcomings led to poor professional activities in the area of education. In some cases, as showed by Makuna et al. [9], teachers had to abandon their online pedagogical work because their electronic devices were either technically old or they malfunctioned because of various causes. For some teachers, however, the problem was much more serious since they did not own any electronic devices. Guevara [11], however, claims that the problem, was in fact much worse, since students had the same problem.

Nevertheless, even if all teachers had had the latest model of internet facilitating electronic devices, the efficiency of online work in education could not have been guaranteed anyway. According to Delita [12] and Müller et al. [13], for online education to work properly, at least two factors must be juxtaposed harmoniously: first, internet services must be capable of providing a satisfactory data transfer rate for optimal communication and second, specialized internet platforms (such as Skype or Zoom) must be usable for many hours, during which time they should work well enough to secure efficient interaction between teachers and students. Verestiuc [3] and Muşat [14] notices that the absence of either factor could lead to serious hindrances in professional activities, and teachers were among the professional categories which experimented such problems on a daily basis. Internet services work better in cities than in villages, but still some urban areas are not much better than rural ones, to the point that teachers were not able to interact with their students online because of poor internet connection. As Mathew et al. [15] put it, 'Poor internet connection is the major setback that plagued many students during this unprecedented COVID-19 pandemic'.

Also, the massive online presence of internet uses in the United States of America led to poorer internet performances of teleconference platforms in Europe (8.00 AM in Eastern Europe corresponds to 22.00 PM the previous day or 2.00 AM the same day in the USA). In other words, the efficiency of online education—especially when it comes to the pedagogical activities of teachers—is largely dependent on the type of internet connections and services used throughout the world. Petrescu [16] discloses that personal subjective factors (such as fatigue, boredom or other negative affects) appear to be fewer than the technological objective factors (like inadequate electronic devices and faulty internet services) in telecommuting to internet-mediated work, so proper internet services are vital for online education and teaching professionals.

This was a real problem for teachers during the COVID-19 pandemic because even if they owned the latest models of various electronic devices and their internet connection worked flawlessly, many were not acquainted with the basic functions of their electronic devices. Parlapani et al. [17] demonstrated that 'Contained acquaintance with the internet, as well as limited familiarity with technology overall' was a real problem for the adult population, including teaching staff. Furthermore, to make the whole situation more complicated, many teaching professionals were not acquainted with specialized online platformers either. Such situations inevitably made online work if not impossible, then at least problematic to the point that pedagogical activities became significantly impaired,

with poor teaching results and perhaps even poorer learning outcomes. In this respect, Clancy et al. [18] show that the transition to online and remote education still lacks some clear standards. As a field of work, education is particularly vulnerable to such possibilities mostly because teachers have never been required to master—or at least get acquainted with—electronic devices in the first place. The situation may change in the future because of the COVID-19 pandemic and the necessity to work online, but for now things do not look bright for online work in the absence of a large number of teachers who know how to engage with students via online electronic devices.

For as long as teachers have no official professional training which confirms their digital competences, education will continue to remain vulnerable in all aspects related to telecommuting to online teaching (Verestiuc) [3]. Nevertheless, the fact that many teachers are not acquainted with online electronic devices is only half of the problem; despite expectations that students should be versed in online devices (including online platforms), they are largely unacquainted with such instruments, especially the young ones in primary schools. This inevitably leads to another, much more serious problem, namely professional dropout—which occurs in times of confinement and isolation.

Abandoning studies has not been unheard of during the COVID-19 pandemic; on the contrary, dropping out from school increased precisely because teaching methods, especially those carried out online, were not adapted to the realities of online mediated pedagogy. Because of a multitude of factors (which include poor acquaintance with electronic devices and online platforms, malfunctioning devices and conference software, as well as negative affect in both teachers and students, coupled with inadequate adaptation of traditional teaching to the necessities of online pedagogy), those who are affected the most by professional dropout are students. The reality of student dropout is complex, but it involves a ‘trinity’ of factors, especially the difficulty of learning, the relationship with parents, and the way the teacher deals with both. According to Verestiuc [3], since they are unable to understand what they are being taught or they cannot process the information because of flawed pedagogical techniques due to online education, the number of students who lost motivation for learning increased during the COVID-19 pandemic. Once motivation has been lost, dropping out is the next—and almost inevitable—step, not only because teaching becomes problematic, but also because evaluations in real time tend to be less efficient and meaningful, according to Barabash et al. [19]. Thus, Bailey et al. [20] proves that student motivation is directly correlative with the ‘perceived learning outcome and student satisfaction’.

However, the COVID-19 pandemic did not cause professional dropout within the student population alone; teachers are very close to that situation as well, especially those who suffer from chronic illnesses and fear that getting inflected may be catastrophic for them. Consequently, as pointed out by Cojan [21], many appear to have asked for early retirement. This is why it is important for online education to not focus exclusively on transmitting relevant information from teachers to students; teachers must learn how students work depending on their age, interests, and talents. In other words, pedagogical strategies must be adapted in such a way that professional dropout is minimized for teachers and students alike, mainly because—according to Campos et al. [22]—‘change in pedagogical strategies’ usually cause ‘uncertainty . . . and insecurity’.

It is clear that teachers must not only get acquainted with electronic devices for a better academic performance in online education (during or beyond the COVID-19 pandemic), but also pursue digital formation consistently and regularly. Students want their teachers to be digitally competent and it would be necessary for all teaching professionals to go through one or more sessions of digital formation, especially because such competence cannot be achieved overnight [23]. Teachers should know how electronic devices work and how they are connected with specialized online platforms for optimal interaction with students during online classes [24]. Nevertheless, digital formation and the corresponding digital competence cannot and should not be limited to awareness of how the internet works in connection with various hardware and software; on the contrary, it must be

extended to thorough knowledge about the psychology of students and teachers alike. According to Heidari et al. [25] and Dolgikh [26], there is a direct connection between the digital competence of teachers and the natural expectations of students, so the issue must be addressed in a way which improves online education for both categories: teachers and students.

Teachers, therefore, must be aware how people in general work when faced with online teaching; in concrete terms, they should know how they function psychologically and physically in their capacity as teaching professionals; they should also be competent in assessing the way their students behave during the academic experience of online teaching. Thus, digital formation is important, vital even for teachers not only during the COVID-19 pandemic, but also beyond it. In other words, digital formation is crucial for teachers primarily because of the times we live in, when electronic devices and internet services become a part of education naturally rather than by external impositions. In this respect, Lituanas et al. [27] specify that digital formation cannot be achieved in the absence of innovation. In a post-pandemic world, therefore, online education will be aimed not only at teaching activities, but also at various learning processes.

If in a world wherein COVID-19 is no longer a pandemic, online education focuses not only on teaching but also on learning, it means that telecommuting to internet-based educational services may become an educational policy on its own. In such a case, this educational policy will have to be not only recognized but also assumed by political governments. Classrooms will have to be adapted to the basic requirements of online education, regardless of whether (all) students will be physically present in schools or not [23]. Petrescu [16] provides evidence in favor of the fact that digital infrastructure, therefore, will have to be built or improved as rapidly as possible, so that during or beyond the COVID-19 pandemic teachers should be able to provide the best possible online teaching experience to their students. E-learning platforms will have to be implemented as educational instruments in a way which accommodates not only a large number of students and professional online interaction with teachers, but also optimal educational content—in other words, these e-learning platforms will have to serve not only connectivity purposes, but also educational (teaching and learning) processes [24]. Petrescu [16] also expresses the conviction [28] that governments will have to focus on providing excellent online connectivity for such e-platforms, but the content of educational activities will also have to be taken into account for professional monitoring. Teachers will have to become proficient in both online activities and online teaching, but in doing so they will have to be adjusted to possible future scenarios which include the reality of another pandemic. This option brings with it the ‘permanence’ of online education with more or less continuous online teaching, as proposed by Cutri et al. [29]. Regardless of whether or when this happens or not, teachers should become increasingly aware of the realities of online education not only from the perspective of students but also from their own standpoint as educational professionals.

The lack of awareness among teachers with regard to the needs of students as involved in online education during the COVID-19 pandemic led to a certain set of problems, which revealed the teacher’s inadaptability to online education, its demands, and its achievement possibilities. For instance, as telecommuting from onsite to online education happened within a very short timeframe, teachers were unable to adapt, which in turn led to their incapacity to work with the regular schedule, show up online for their daily duties or even assess the workload given to students. As a result, Chang et al. [30] show that the efficiency of learning waned dramatically, while Amini et al. [31] reveal that complains from students increased exponentially. Teachers started to give more homework to students in an attempt to ‘compensate’ for the lack of onsite interaction, which indicates that teachers were under the impression that online teaching is inferior to and less efficient than onsite pedagogy. According to Paraschiv [32], this led to the incapacity of students—especially those around twelve or thirteen years of age (sixth and seventh grades) to form a basic set of skills for their subsequent education and learning techniques. Moreover, Popovici et al. [4] discuss the fact that some teachers either refused to teach online or were unable to do so for various

reasons (including their incapacity to use electronic devices and online platforms or just the feeling that online teaching is inadequate for efficient learning), which resulted in some subjects being totally ignored during the COVID-19 pandemic and students being deprived of proper pedagogical support.

Petrescu [16] concludes that teachers no longer adequately transmitted vital scientific information to their students, which made the evaluation of learning almost impossible. In such cases, families were forced to step in as they attempted to supplement the lack of the teachers' presence in online classes, which is a relevant indicator of the fact that teachers and students are not the only relevant actors in education, but also part of the local communities which they serve, as highlighted by Zhao et al. [33]. These initial considerations do not warrant the conclusion that online education was sustainable on the long run, but these aspects reflect the negatives of online education; this study, however, investigates the practical reality of online education with the purpose of identifying not only the negatives but also some potential positives, in which case, online education can be taken into account as a sustainable enterprise on the long run in the future as a valid educational system.

### 3. Hypothesis and Methodology

The data used in our analysis were collected through a random technique from pre-university and university teachers in Romania through an online questionnaire. The questionnaire consists of closed questions. The instrument used for data collection was delivered using Google Form to school and university teachers. The questionnaire is divided into 4 sections and includes 32 questions (Nemteanu et al.) [34].

Since it is a correlational study, the hypotheses were formulated based on the variables and the possible relationships between them (positive or negative). All hypotheses focus on online education and how various personal and objective characteristics of the teaching professionals correlate with their perception of online education and students' academic performance during distance learning which should clarify whether online education can be adequately considered a valid learning option not only during the COVID-19 pandemic, but also beyond its direct consequences on the traditional onsite education.

According to education professionals' opinion, distance education involves not only appropriate methods and tools and technologies in order to facilitate communication but also training, experience and support. The promise of better quality was made years before, in institutions with relevant practice of this type of education but which, at least in Romania, have failed to gain a reputation for high quality.

Examining the pedagogic discourse during remote teaching one should notice the struggle of innovating, the personal touch, even decisions on changes of instruction format. According to Hashemi [35], Moè et al. [36], there is a concern on how this effort affects the quality of education and how it affects the self-image as teaching professionals in terms of professional satisfaction.

Our hypotheses focus on online education and on how is perceived academic performance. Their validation has the potential of highlighting sustainable education, meaning to clarify whether online education can be a valid learning option for the future. In this respect we took into consideration the wider perspective and specific elements on distance communication and educational impact.

Distance learning is facilitated by the development of certain skills, including communicative competence in the context of using multimedia as an alternative to traditional means (Kyrpychenko et al.) [37], used in learning and self-learning as complex processes being themselves flexible (Dolgikh) [26] and subject to permanent change.

Remote communication is based on infrastructure, a network that ensures the absence of interruptions, therefore on functionally stable networks, according to Barabash et al. [19]. Their lack often results in the failure of the communication and learning process and frustrations and lack of professional satisfaction on the part of teachers.

### 3.1. Hypothesis Formation and Development

**Hypothesis 1 (H1).** *The number of electronic devices owned by teaching professionals is negatively correlated with the difficulty they face in adapting to distance learning.*

This could be a preoccupation for almost every teacher in the world. We brought into discussion the global scale because, according to Obrad et al. [38], there is undoubtedly an urban-rural cleavage in almost every country that translates into unequal opportunities in access to technology and inherently to education. Along outdated or even malfunctioning equipment, there are internet connection quality problems worldwide, which imply connection errors as well. Also, concerning the urban-rural cleavage, it has been found that teaching professionals from urban schools perceived themselves as having better digital skills than those from rural educational institutions Hatos et al. [39]. There is also a crippling lack of familiarization with the teaching platforms. All these factors can affect the degree of commitment and engagement of students in didactic activities.

Based on this information, we can infer that the number or quality of the electronic devices a teacher owns is not the only aspect that has an impact on the quality of the educational act, be it good or bad. In supporting this assumption, Yu et al. [40] (p. 3) state that an online teaching environment does not necessarily generate the possibility of innovative teaching. Most of the time, online lectures have the tendency to become a ‘one-man show’ (of the teachers), leading to reduced interaction and automatically low course satisfaction for both sides (educators and learners).

Moreover, there is another interesting finding put in place by De La Rama et al. [41], who affirm that male teachers could have more chances in getting the know-how of using technological devices and online applications and could be more inclined to solve internet connection issues than their female colleagues because they are much more preoccupied to invest in such didactic prerequisites.

It could be generally accepted that the lack of electronic devices has had and continues to have an obvious role in the reduction of the clarity of online tasks given by the teacher to the students, according to Simut et al. [42]. But in reality, facts are very questionable, as most of the scientific literature is pointing out that the limitations of the online teaching mechanisms, meaning the available infrastructure, have put wider constraints on quality teaching, rather than on performing teaching roles. The findings of Dogar et al. [43] (p. 20) showed that students do not feel there is any compromise on the quality of teaching in terms of content discussed or shared with the student. One problem observed in all countries, albeit to different extents, was insufficient bandwidth, producing delays or connection failures during lessons and video conferences. In fact, not all geographical areas are reached by a broadband connection: this means that in some cases there is a structural gap that represents an obstacle for people connection (Ferri et al.) [44] (p. 7).

However, despite the problems presented by online education, the inherent limitations of online interaction between teachers and students does not necessarily lead to a lower quality of learning; on the contrary, if some issues considered problematic in connection with online education can be surpassed—and they can if the infrastructure is bettered and teachers/students adapt to its means—it can be at least inferred that online education is not doomed to fail from the onset. Thus, online education has the potential of being considered a sustainable educational system for as long as online infrastructure is correlated with the skills of educational professionals and the needs of students. Moreover, Ansar et al. [45] prove that the negative perception of students regarding the presumed lower quality of online education is not automatically and necessarily an objective indicator of the lack of quality when it comes to the implementation of online education. Consequently, as seen by Ionescu et al. [46], if a certain level of efficiency can be maintained in online education, its sustainability is logically ascertained, and online education can be supported as sustainable.

**Hypothesis 2 (H2).** *Teaching professionals' competencies in using software and the internet are positively correlated with their level of preparedness for distance learning.*

This could also be linked to the experience and time needed to form the so-called readiness. In fact, one semester to two years of online teaching experience was insufficient for decreasing expected challenges or increasing the expected number of communication channels or activity choices when teaching online. A study among participants originating in universities located in South Korea conducted by Bailey et al. [20] (p. 184) showed that at least two years of online teaching experience are needed to mitigate statistically significant levels of expected challenges.

It is known that teachers were familiar with teaching methods in face-to-face delivery in classrooms before the abrupt breakout of COVID-19 and their information technology literacy was limited to the integration of digital equipment into classroom teaching, with little knowledge and skills for online teaching, according to Gao et al. [47] (p. 8). In the Romanian context, Hatos et al. [48] discuss a low level of preparedness for online education among the stakeholders, including the teaching professionals.

In the wake of the pandemic, teachers, young and old, who do not necessarily have a strong pedagogical know-how of technology related strategies, were self-obliged and duty-bound to engage themselves into online teaching. Additionally, the pandemic prompted teachers to shift, create, and implement online teaching even if they do not feel properly prepared to do so, or had little interest in online instruction. A great majority of the teachers who were not interested in online teaching seemed to be coping with and adjusting to the new delivery method of instruction over the traditional face-to-face classes (Dimaculangan et al.) [49] (p. 325). In managing the implementation of online learning, differences were observed between males and females. A study conducted on Romanian population conducted by Hatos et al. [39] identifies gender differences regarding self-assessed ICT skills: office digital skills are specific to women, while multimedia and online skills are perceived to be more advanced among men.

Moreover, while the current context of online migration arguably provides for only the very slimmest and superficial of encounters for academics with digital pedagogy, its introduction at a time of extreme stress and uncertainty is fixing a highly reductive and recusant view, in many cases limited to a notion of 'posting things online' and of technology causing role-invalidation. In the latter case, academics' fear of the impact of a digital revolution on their jobs is already being confirmed, with some institutions allegedly now permanently moving substantial chunks—up to a quarter—of their teaching portfolio online (Watermeyer et al.) [50] (p. 638).

It is quite clear that for as long as teaching professionals become digitally literate, their relationship with students is prone to become better, as shown by Sánchez-Cruzado et al. [51], digital literacy is important for the maintenance of a cartel level of pedagogical/academic efficiency in online education. If this is true, then it is not too far-fetched to consider the possibility of long-term sustainability for online education in the future, irrespective of whether one has it in mind for pandemic contexts of other situations which demand its extensive use as a valid educational system.

**Hypothesis 3 (H3).** *Teaching professionals' competencies in using software and the internet are negatively correlated with the difficulty they have in performing teaching roles.*

It could be admitted that the field of online education is a relatively new discipline, and definitions relating to the role(s) of online educators are fragmented and frequently unclear. It is difficult to search the literature for the less well-defined terms used in this discipline. For example, according to Ní Shé et al. [52] (p. 11), one may not be able to search for skills required by e-tutor as the term e-tutor is not well defined; it may have other denominations and there is no consensus as to what particular role this term is describing. According to a study conducted by Rony et al. [53] (p. 57), interviewed faculty



members in Bangladesh have mentioned that there would be necessary an effective change of mindset and perception for online teaching learning training, class conduction and assessment. Bearing this in mind, Gao et al. [47] (p. 12) stress out that teachers' cognitions about online teaching are congruent with their online instructional practice, meaning that they choose appropriate platforms and adopted various teaching methods based on their cognitions about students' learning needs in their courses. Further, Yu et al. [40] (p. 4) bring into discussion three branches of these so-called cognitions: personal teaching efficacy (related to the teacher's confidence on his/her own ability to influence students); general teaching efficacy (related to the teacher's awareness of the education's role in the student development); and finally, the information and communication technology efficacy (related to teacher-perceived competencies to use ICT for teaching purposes). According to Bailey et al. [20] (p. 177), instructors who are new to online teaching face many challenges in implementing courses and those who have less favourable views of technology are likely to have more difficulties. In fact, Rapanta et al. [54] (p. 924) agree and report that some of the main difficulties encountered by university teachers with respect to web-based courses arise from the complexity of the instructional situation and shortcomings in planning and organisation. Also, Singh-Pillay et al. [55] (p. 1132) even bring into discussion the carry-over effect, meaning that the constraining technical training lecturers received for online teaching contributes to dilemmas associated with (mis)matching pedagogy and students' learning styles during online teaching. Even Howard et al. [56] (p. 142) blame this situation and state that schools adopting online learning are left with limited guidance about how teachers can be supported or what may be an appropriate vision for online learning. To make the things clearer, Patel [57] (p. 162) sums up the nine dimensions that an online educator could pay attention to: modality, pacing, student-instructor ratio, pedagogy, instructor role online, student role online, online communication synchrony, role of online assessments, and source of feedback.

According to Peimani et al. [58], the adaptability of teaching professionals to the reality of online education is crucial for the efficiency and sustainability of internet-based teaching realities. Pedagogical methods and personal perceptions about online education can be changed if teaching professionals are willing to adapt to the complexities of online education; if so, it is reasonable to argue that when online education becomes efficient it also becomes sustainable in the long run as a valid educational system.

**Hypothesis 4 (H4).** *Negative affect of the teaching professionals is positively correlated with the difficulty they have in performing teaching roles.*

The hypothesis can be translated into a focus on the learning process rather than the end product or on the teacher as a facilitator rather than as a transmitter of knowledge. Carrillo et al. [59] (p. 477) concede that there is quite an adversity between social presence, cognitive presence and teaching presence in the online system. Although not always the main focus of research, the element of teaching presence was included in all the papers analysed, as it supported social and cognitive presence with the aim of achieving certain learning outcomes. Obrad [60] (p. 15) even states that changes that took place and the stress caused by technology led to the occurrence of negative emotions. What is clear, as Taxer et al. [61] also concludes, is that the development of high-order cognitive skills required not only strong social presence, but also the ability of the teacher to guide students' collaborative efforts in the transition from content reflection to critical reflection. Sepulveda-Escobar et al. [62] (p. 591) go further on this idea and affirm that online and blended courses can also present some challenges for teachers, who often tend to feel isolated facing lower self-confidence and more pressure to increase their self-learning and independent workload.

In line with previous findings, this hypothesis is heavily based on individual perceptions about the reality of online education within the community of teaching professionals. However, when teaching professionals realise that online devices are a means to an end, in this case the improvement of education for their students, claiming that online education

is sustainable falls within the confines of reasonableness. Personal interaction may be perceived as poorer in online education but it can be compensated by the efficiency of online presence (in the sense that students can be literally present in class although online and this is a facilitation of efficiency in education according to Liman Kaban [63], which makes the process easy to supervise and, in so doing, efficient in conveying educational information. How teachers and students related as part of these online interactions is a different matter but it is not something which could affect the overall sustainability of online education as a valid teaching tool.

**Hypothesis 5 (H5).** *Negative affect of the teaching professionals is positively correlated with the difficulty of adapting to distance learning.*

Not only does the question arise as to whether the lockdown may be compensated for through teachers' and students' use of digital tools in online teaching, but the question of how teachers' competence and teacher education opportunities to learn digital competence contribute to teachers' mastery of the challenges of the specific situation also comes to the fore, according to König et al. [64] (p. 608). Since most younger teachers belong to the 'digital native' generation, it is expected of them to be able to quickly adapt to the online teaching challenges posed by the current situation. With regard to these technical competencies, Martin et al. [65] (p. 99) say that they are specific to the use of technology, independent of pedagogy—and indeed, the lack of them may affect the ability to assist learners effectively; they even concentrate on two aspects of the readiness to teach online: first, the instructor's attitude on the importance of online teaching and second, the instructor's perceptions of his/her ability to confidently teach online.

It itself, adapting to new conditions is not automatically a negative aspect of online teaching. Some people may find it more difficult to adapt to screen-based teaching, although such interaction is not insurmountable. According to Răducu et al. [66], 'adaptability to online teaching' is 'essential for an effective teacher'. Supposing that one does adapt to online teaching, then the whole education process based on internet-related education can reach a certain level of efficiency and, by default, an equally reasonable level of sustainability and validity as an educational instrument in the future.

**Hypothesis 6 (H6).** *Academic performance of the students is positively correlated with the teaching professionals' satisfaction with their work.*

According to Ní Shé et al. [52] (p. 24), the personal satisfaction can be broader understood by teaching professionals if they are able to perceive their work as one of the identified roles for online educator: life skills promoter role, designer/planning pole, learning support role, facilitator, content expert or a much more personal role.

Subjective as it is, personal satisfaction is important mainly because, as shown by Kanetaki et al. [67], it is linked to academic achievement; one, however, must not lose sight of the fact that this indicator is heavily subjective in nature. This pushes things into the direction of adaptability once more, predominantly within the context of one's intentionality regarding personal satisfaction; in other words, if one genuinely wishes to teach/learn as part of online education, the reality of personal satisfaction will be dependent on one's readiness to do one's best as educator/student. When such personal satisfaction is reached in either side (teachers/students), online education can no longer be considered ineffective. As Moè et al. [68] argue, when its efficiency is established based even on subjective factors—such as personal satisfaction—the sustainability of online education is no longer a presupposition but a realistic possibility.

**Hypothesis 7 (H7).** *Academic performance of the students is positively correlated with the perceived effectiveness of distance learning teaching activities.*

Overall, live (synchronous) lectures may be particularly valuable in ensuring an appropriate level of “teacher-presence” in online teaching in universities (Harris et al.) [69]. Teacher presence afforded through online lectures allows students to feel more connected to their lecturers, which can promote student success and engagement. The paradox is that professional development opportunities might be constrained due to the implementation measures in a specific college or department, rather than a university-wide implementation (Richardson et al.) [70] (p. 69). According to Postareff et al. [71], it can be argued that online teaching mode is providing the feeling of psychological safety to learning community in COVID-19 afflicting period.

The first basic step is that teaching staff should start preparing online by learning how to split a big single task into multiple small tasks (Mahmood) [72] (p. 201). The second step is about the changing process under which two options are left for consideration: either to adopt a new online mode (which is already known or put in practice elsewhere) or to innovate one’s own (Mishra et al.) [73]. Some of the issues (self-questions) that might deter faculty members from teaching online include wondering if they are qualified to teach online, how to maintain their own identities and attributes as instructors, what the learners’ demographic might be, how to meet discipline-related demands, what kind of training they would need, how to be successful online instructors, how to assess and evaluate learning outcomes, and how to deal with stress and feelings of frustration while making the transition to online learning environments (Albrahim) [74] (p. 12).

By initiating online lectures (like in traditional ‘face to face’ lectures), teachers ensure that the pedagogies they put into place were actionable and based on available means. But difficulty of adapting is also linked to effectiveness—according to Tanis [75], the online instructor must be energetic, organized and communicative with students and have a consistent presence in the online classroom to provide an active, quality learning experience through faculty, student and content engagement. Based on focus group discussion among university professors in the U.S.A. (Whittle et al.) [76] (p. 313), teachers who considered their instructional responses to be effective began with an inquiry of the teacher’s abilities, familiarity with technologies, and time; the students’ health and safety, access to basic needs, and access to technologies; and their collective resources.

Such conclusions clearly indicate that online education can be sustainable in the long run as a valid educational instrument. Various government or non-government policies can be established to support the improvement of online education as an educational system as well as an educational reality which inspires teachers and students. In this respect, Rulandari [77] is right to assume that government policies should be aimed at ‘overcoming learning problems’ in order to maintain a certain level of educational efficiency. Thus, its sustainability becomes a matter of community-related interests and their corresponding support within various communities.

**Hypothesis 8 (H8).** *Teaching professionals’ satisfaction with their work is positively correlated with the perceived effectiveness of distance learning teaching activities.*

It can be argued that general teaching efficacy cannot be a mediator between online and face-to-face teaching. For instance, the results of a study in China universities conducted by Yu et al. [40] (p. 1) show that teachers’ online informal learning in pandemic improved their personal teaching efficacy and ICT efficacy (mentioned in a previous paragraph) and then facilitated their innovative teaching without differences of gender and teaching-age effect. The answer could rely on the side of students—some of them often reported a lack of interest and attention during the online classes as they were not accustomed of learning with smartphones and computers, which instead of helping them, turned into a major setback. Consequently, the perceived effectiveness of online teaching can be about developing soft skills, especially online listening skills for students, as early as possible (Mishra et al.) [73].

In fact, according to Ní Shé et al. [52] (p. 24), personal satisfaction can be broader understood by teaching professionals if they are able to perceive their work as one of

the identified roles for online educator: life skills promoter role, designer/planning pole, learning support role, facilitator, content expert or a much more personal role. It can be agreed that educators who move from traditional teaching to the online environment often bring their traditional pedagogies with them, which may not be as effective in the online environment; they need professional development on using online pedagogies. Teachers with a greater sense of self-efficacy may be more involved in finding effective solutions for distance learning. Hatos [78] showed that the people most engaged in collective problem solving are those with positive self-perceptions and a strong sense of self-efficacy, which is directly linked to the level of work satisfaction.

Besides technical difficulties, it can be included here teacher's personal problems (Joshi et al.) [79] (p. 205): a certain lack of technical knowledge, negative attitudes, a consistent lack of motivation—all of them put together, could damper their engagement in online teaching and assessments. A powerful theme identified in a study of Whittle et al. [76] was the inadvertent obfuscation of learning goals. During COVID-19 pandemic, participants experienced a focus on the method of delivering instruction rather than the learning goals, leading to uncertainty around assessment for both teacher and student. The emergent theme of the instability of expectations highlights the importance of a step that is normally "assumed" in lesson design. Cutri et al. [29] (p. 368) state that this instability is also centred around a state of not yet having established a comfortable way of working in the new e-learning environment and a strong desire to return to the known teaching format. In this context, a lecturer may feel confident and efficient at teaching in a familiar offline teaching setting. However, a lecturer without previous experience in online teaching may feel lost in the digital realm of university teaching and thus have low self-efficacy beliefs (Kaqinari et al.) [28] (p. 5). Teachers' self-efficacy was significant for providing task differentiation as well, but also for providing feedback to students. These findings correspond with research that emphasizes the importance of teacher competence in successfully attaining relevant educational goals (König et al.) [64] (p. 617). An experimental analysis for a period of 6 months in China between a synchronous teaching group and an asynchronous teaching group revealed that the most crucial factor for the difference in student academic performance is the difference between the teacher and student communication of the two groups during the online process (Yao et al.) [80] (p. 523). Lengthy use of online interaction (Mishra et al.) [73] has revealed the many problems encountered by university teachers and students in India. The online classes problematic is that, in certain subjects where the content is abstract, many concepts exist that need real face to face interaction for complete understanding.

Nevertheless, complete understanding is difficult to assess, evaluate, and confirm as mandatory in education even if, as demonstrated by Gupta et al. [81], the students' perception about the possibility of achieving complete understanding in online education is rather negative. For as long as teachers and students are indeed connected—and online education does connect teachers and students although through the mediation of screens and internet services—asserting the efficiency of online education as a sustainable educational system is neither inherently illogical, nor irresponsibly supported as valid instruction.

### 3.2. Methodology

The present study is a quantitative research that assesses the relationship between certain variables (Table 1) regarding personal subjective factors (skills, affect, difficulties in adapting, level of preparedness, professional satisfaction) and technological objective factors (inadequate electronic devices, faulty internet services), while bearing in mind the possibility of online education to be considered a genuinely valid system of learning in the future.

The scale measuring the teaching professionals perceived digital competencies in using software and the internet is composed of 8 Likert-type items. This scale has been used before in a study conducted by Hatos et al. [39], who concluded that it has good reliability (Alpha Cronbach > 0.7).

**Table 1.** Variables of the study and their measurement.

Variable	Proposed Item	Measurement
Number of electronic devices owned by the teaching professionals	Do you own a smartphone/tablet/computer/laptop?	Dichotomous scale (Yes/no)—summative scale
Teaching professionals' competencies in using software and the internet	How do you assess your skills in carrying out the following tasks? (8 items)	4-point Likert scale (1—no competence; 4—very high competence)—summative scale
Negative affect of the teaching professionals	Statements about online teaching. How often have you felt in the last year that these statements characterize you? (9 items)	5-point Likert scale (1—never; 5—almost always/very often)—summative scale
Academic performance of the students	How do you rate students' academic performance compared to offline activity?	5-point Likert scale (1—decreased significantly; 5—increased significantly)—summative scale
Difficulty of adapting to distance learning	How difficult do you personally find adapting to distance learning?	10-point scale (1—not difficult at all; 10—extremely difficult)
Level of preparedness for distance learning	Assess your level of preparedness for distance learning.	10-point scale (1—totally unprepared; 10—very well prepared)
Teaching professionals' satisfaction with their work	How do you rate your personal satisfaction with the work you do compared to offline activity?	5-point Likert scale (1—decreased significantly; 5—increased significantly)
Difficulty in performing teaching roles	Specify the level of difficulty with which you carry out teaching roles in the context of distance learning (7 items).	5-point Likert scale (1—very easily; 5—very hardly)—summative scale
Perceived effectiveness of distance learning teaching activities	Please rate the effectiveness of the distance learning activities currently in place compared to traditional methods.	10-point scale (1—no effectiveness; 10—same effectiveness)

In order to assess teachers' affects we used a 20-item Likert-type scale. We performed a factor analysis of the items using principal axis factoring and Varimax rotation (KMO = 0.920; Bartlett  $p < 0.01$ ). The analysis revealed 3 principal factors, which account for 67.099% of the total variance. Of these factors, we focused on the second one, covering 61.006% of the variance in the data. This factor contains the items assessing negative affect, as follows:

How often in the past year have you felt these statements characterize you?

1. I felt like everything was changing too fast around me
2. Having to teach online made me tense and nervous
3. I was demotivated about the teaching activity
4. I felt exhausted
5. I felt I had too much to do and too little time
6. I felt frustrated with the way teaching was performed
7. I felt mentally tired
8. I had insomnia
9. I felt like crying

For this negative affect towards online teaching scale, we identified an Alpha Cronbach  $> 0.7$ . We followed the same procedure for the scale measuring difficulty in performing teaching roles (KMO = 0.898; Bartlett  $p < 0.01$ ). As expected, only one factor was extracted. The scale consists of the following items:

Rate the level of difficulty with which you perform the following teaching roles in the context of distance learning:

1. Didactic projecting
2. Teaching
3. Stimulating learning

4. Assessment
5. Classroom management
6. Communication/parental guidance
7. Communication with other teachers

The Alpha Cronbach for this scale is >0.7.

The sample is representative of the general population of teachers based in Romania, in terms of gender, age, experience in the educational field, subjects taught by the teaching professionals and grade level of teaching, with a confidence interval of 5%, within a confidence level of 95% (Table 2). The questionnaire was completed by 889 teachers from Romania (the final number of valid cases is 881). Of these, the majority work in schools (91.5%) and almost half teach at schools in rural areas (42.3%). In terms of gender, the sample is predominantly female (85.5%). Most of the respondents are aged between 31–50 (67.9%); only a small percentage are under 30 (11.8%) and the rest are in the 51–60 age group (20.3%). Regarding their work experience in education, the following data are available: under 5 years (11.8%), 6–10 years (12.4%), 11–15 years (17.8%), 16–20 years (16.9%), 21–25 years (19.4%), over 25 years (21.70%). The majority of teachers who participated in this study teach humanities (48.1%).

**Table 2.** Research Data.

Study Universe	50,000 Teachers
Data collection method	Online questionnaire distributed to teaching professional through Google forms via internet
Sample unit	Teaching professionals from schools and universities
Sample	889
Margin of error (Confidence Interval)	±5%
Confidence level	$p = 95\%$

Next, we performed correlation analyses, followed by a hierarchical multiple regression analysis to test if our variables of interest explain a statistically significant amount of the variance in the dependent variable. The variables used in the regression analysis are shown in Table 3; the dependent variable is Perceived effectiveness of distance learning teaching activities and the independent variables we included in the analysis are the ones that had a correlation coefficient greater than 0.3 with the dependent variable.

**Table 3.** Variables introduced in the regression analysis.

Variable Type	Variable Name	Measurement
Dependent variable	Perceived effectiveness of distance learning teaching activities	10-point scale (1—no effectiveness; 10—same effectiveness)
Independent variables	Level of preparedness for distance learning	10-point scale (1—totally unprepared; 10—very well prepared)
	Academic performance of the students	5-point Likert scale (1—decreased significantly; 5—increased significantly)—summative scale
	Difficulty in performing teaching roles	5-point Likert scale (1—very easily; 5—very hardly)—summative scale
	Difficulty of adapting to distance learning	10-point scale (1—not difficult at all; 10—extremely difficult)
	Teaching professionals' satisfaction with their work	5-point Likert scale (1—decreased significantly; 5—increased significantly)
	Gender	Dichotomous scale (masculine, feminine)

Table 3. Cont.

Variable Type	Variable Name	Measurement
	Age	Dummy variable for under 30, 31–40 s, 41–50 s, 51–60 s; reference category: over 60
	Level of education	Dummy variable for high school (12 grades), university studies (bachelor), postgraduate studies (master); reference category: doctoral studies
	Grade level of teaching	Dichotomous scale (university, pre-university)
	School location	Dichotomous scale (rural area, urban area)

The variables were grouped into 3 blocks (Figure 1): in the first block we introduced the socio-demographic variables, which are also the control variables of the study—gender, age, level of education, grade level of teaching and school location. In the second block we have introduced variables measuring the academic performance of the students and the teaching professionals' level of preparedness for distance learning. In the last block (block 3) we introduced the variables regarding personal subjective factors: difficulty of adapting to distance learning, difficulty in performing teaching roles and the teaching professionals' satisfaction with their work.

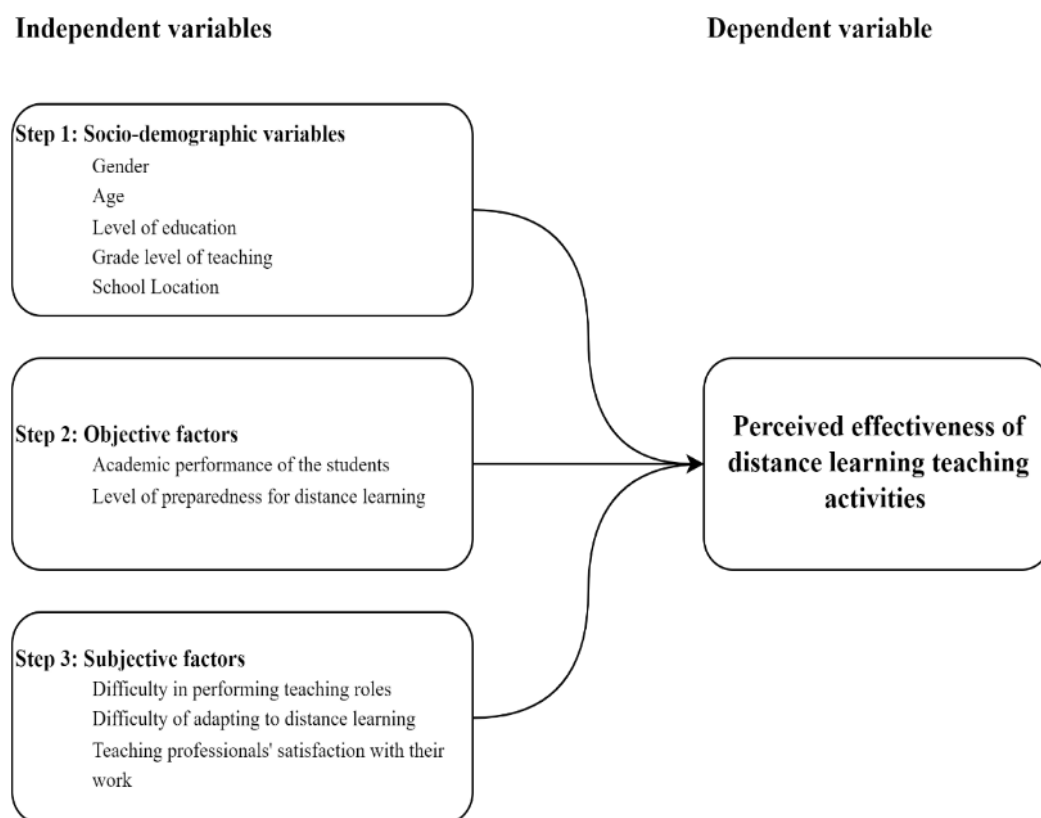


Figure 1. Schematic conceptualization of the hierarchical multiple regression analysis.

#### 4. Results

This section presents the results of the analysis of data collected from 881 participants. Data analysis and hypothesis testing were performed using correlation analysis (Spearman correlation coefficient), followed by a hierarchical multiple regression, employing SPSS 27 software. The correlation analysis results can be found in Table 4, followed by a figure that better illustrates how strong the relationships between the variables are (Figure 2).

**Table 4.** Correlation analysis result (Spearman coefficient).

		Number of Electronic Devices Owned by the Teaching Professionals	Teaching Professionals' Competencies in Using Software and the Internet	Negative Affect of the Teaching Professionals	Difficulty in Performing Teaching Roles	Difficulty of Adapting to Distance Learning	Level of Preparedness for Distance Learning	Academic Performance of the Students	Teaching Professionals' Satisfaction with Their Work	Perceived Effectiveness of Distance Learning Teaching Activities
Number of electronic devices owned by the teaching professionals	Correlation Coefficient	1	0.190 **	−0.130 **	−0.148 **	−0.181 **	0.175 **	0.081 *	0.098 **	0.158 **
	Sig. (2-tailed)	.	0.000	0.000	0.000	0.000	0.000	0.018	0.004	0.000
Teaching professionals' competencies in using software and the internet	Correlation coefficient	0.190 **	1	−0.229 **	−0.383 **	−0.313 **	0.438 **	0.225 **	0.159 **	0.256 **
	Sig. (2-tailed)	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Negative affect of the teaching professionals	Correlation Coefficient	−0.130 **	−0.229 **	1	0.358 **	0.373 **	−0.286 **	−0.240 **	−0.282 **	−0.274 **
	Sig. (2-tailed)	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000
Difficulty in performing teaching roles	Correlation Coefficient	−0.148 **	−0.383 **	0.358 **	1	0.331 **	−0.345 **	−0.293 **	−0.266 **	−0.364 **
	Sig. (2-tailed)	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000
Difficulty of adapting to distance learning	Correlation Coefficient	−0.181 **	−0.313 **	0.373 **	0.331 **	1	−0.359 **	−0.283 **	−0.224 **	−0.319 **
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000
Level of preparedness for distance learning	Correlation Coefficient	0.175 **	0.438 **	−0.286 **	−0.345 **	−0.359 **	1	0.224 **	0.183 **	0.314 **
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000
Academic performance of the students	Correlation Coefficient	0.081 *	0.225 **	−0.240 **	−0.293 **	−0.283 **	0.224 **	1	0.568 **	0.438 **
	Sig. (2-tailed)	0.018	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000



Table 4. Cont.

		Number of Electronic Devices Owned by the Teaching Professionals	Teaching Professionals' Competencies in Using Software and the Internet	Negative Affect of the Teaching Professionals	Difficulty in Performing Teaching Roles	Difficulty of Adapting to Distance Learning	Level of Preparedness for Distance Learning	Academic Performance of the Students	Teaching Professionals' Satisfaction with Their Work	Perceived Effectiveness of Distance Learning Teaching Activities
Teaching professionals' satisfaction with their work	Correlation Coefficient	0.098 **	0.159 **	−0.282 **	−0.266 **	−0.224 **	0.183 **	0.568 **	1	0.351 **
	Sig. (2-tailed)	0.004	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000
Perceived effectiveness of distance learning teaching activities	Correlation Coefficient	0.158 **	0.256 **	−0.274 **	−0.364 **	−0.319 **	0.314 **	0.438 **	0.351 **	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.

\* Correlation is significant at the 0.05 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed).

Number of electronic devices owned by the teachers	1									
Teaching professionals' competencies in using software/internet	0.190	1								
Negative affect of the teaching professionals	-0.130	-0.229	1							
Difficulty in performing teaching roles	-0.148	-0.383	0.358	1						
Difficulty of adapting to distance learning	-0.181	-0.313	0.373	0.331	1					
Level of preparedness for distance learning	0.175	0.438	-0.286	-0.345	-0.359	1				
Academic performance of the students	0.081	0.225	-0.240	-0.293	-0.283	0.224	1			
Teaching professionals' satisfaction with their work	0.098	0.159	-0.282	-0.266	-0.224	0.183	0.568	1		
Perceived effectiveness of distance learning teaching activities	0.158	0.256	-0.274	-0.364	-0.319	0.314	0.438	0.351	1	
	Number of electronic devices owned by the teachers	Teaching professionals competencies in using software and the internet	Negative affect of the teaching professionals	Difficulty in performing teaching roles	Difficulty of adapting to distance learning	Level of preparedness for distance learning	Academic performance of the students	Teaching professionals satisfaction with their work	Perceived effectiveness of distance learning teaching activities	

Figure 2. Correlation matrix heatmap.

As a result of these analyses, we noticed a statistically significant negative correlation ( $-0.181^{**}$ ) between the variables mentioned in the first hypothesis: the number of electronic devices owned by the teaching professionals and the difficulty they face in adapting to distance learning. The analyses support the first hypothesis, we can state that the more electronic devices the teachers own, the less difficult they find it to adapt to distance learning, which seems to support the idea that online education can become a sustainable educational form of teaching and learning.

The results revealed a statistically significant positive correlation ( $0.438^{**}$ ) between the teaching professionals' competencies in using software/internet and their level of preparedness for distance learning, supporting Hypothesis 2: if teachers perceive that they have a high level of competencies, they automatically feel more prepared for distance learning which, in turn, reveals the huge potential for sustainability of online education in general.

The relationship between teaching professionals' competencies in using software/internet and the perceived difficulty in performing teaching roles is also statistically significant and negative ( $-0.383^{**}$ ), supporting Hypothesis 3. We can affirm that when teachers assess they have enhanced competences in using software/internet, they perceive it is easier to perform their teaching roles, thus confirming that online education can be sustainable on the long run as valid instructional option in all sorts of educational contexts.

The level of negative affect has a significant impact on perceived difficulty in performing teaching roles ( $0.358^{**}$ ), providing support for Hypothesis 4. The higher the level of negative affect, the more difficult teachers perceive it to be for them to perform their teaching roles. The same type of relationship was found when studying the negative affect in association with the difficulty of adapting to distance learning (Hypothesis 5), respectively a positive correlation ( $0.373^{**}$ ). This is indicative of potential positive outcomes because when subjective, personal perceptions are reversed from negative to positive or improved from good to better results, it is quite clear that online education can be reasonably considered sustainable in the future.

Analysing the students' academic performance, we noticed that there is a strong significant positive correlation between it and the teaching professionals' satisfaction with their work ( $0.568^{**}$ )—Hypothesis 6—as well as between students' performance and the perceived effectiveness of distance learning teaching activities ( $0.438^{**}$ )—Hypothesis 7. Greater academic results are associated with a high level of professional satisfaction in

teachers and a more favourable perception of the effectiveness of online learning which, in turn, leads to its posited sustainability in the long run.

A statistically significant positive correlation is also revealed between satisfaction and perceived effectiveness of distance learning teaching activities (0.351), indicating that when satisfaction is higher, so is perceived effectiveness—in such cases, online education is not only efficient but also sustainable as a valid educational system in various future contexts.

The regression analysis equations are as follows:

Model 1:  $Y = 5.968 + (-0.160 \times \text{gender}) + (-0.199 \times \text{age}) + (-0.724 \times \text{level of education}) + (0.522 \times \text{grade level of teaching}) + (-0.240 \times \text{school location})$

Model 2:  $Y = 2.176 + (-0.005 \times \text{gender}) + (-0.270 \times \text{age}) + (-0.524 \times \text{level of education}) + (-0.036 \times \text{grade level of teaching}) + (-0.123 \times \text{school location}) + (0.849 \times \text{academic performance of the students}) + (0.260 \times \text{level of preparedness for distance learning})$

Model 3:  $Y = 4.674 + (-0.086 \times \text{gender}) + (0.057 \times \text{age}) + (-0.376 \times \text{level of education}) + (0.054 \times \text{grade level of teaching}) + (-0.111 \times \text{school location}) + (0.568 \times \text{academic performance of the students}) + (0.151 \times \text{level of preparedness for distance learning}) + (-0.079 \times \text{difficulty in performing teaching roles}) + (-0.097 \times \text{difficulty of adapting to distance learning}) + (0.192 \times \text{professional satisfaction})$ .

Examining the results of the hierarchical multiple regression, we find that socio-demographic variables introduced in the first block (gender, age, level of education, grade level of teaching, school location) hardly explain any of the variance (about 1.8%). The introduction of the variables: academic performance of the students and the level of preparedness for distance learning of the teachers in the second block improves the model, explaining a total of 23.1% of the variance of the dependent variable. The addition of the variables in block 3 produces a 6.5% improvement in the predictive capacity of the model. The final model explains 29.5% of the total variance. For the second model the value of  $F$  is 22.20,  $p < 0.01$ ; for the third model  $F = 24.58$ ,  $p < 0.01$ ; both predictor models are highly significant, meaning they both improve our ability to predict the dependent variable. We therefore observe a significant increase in predictive power from model to model (Table 5).

**Table 5.** Model fit change in hierarchical modeling.

Model	Adjusted R Square	Change Statistics		
		R Square Change	F Change	Sig. F Change
1	0.018	0.018	1.518	0.128
2	0.231	0.224	123.411	0.000
3	0.295	0.065	26.072	0.000

Adding the academic performance of the students and the level of preparedness for distance learning of the teachers to the model (block 2) improves its predictive capacity at predicting the perceived effectiveness of distance learning teaching activities in a statistically significant way and increases the percentage of variance accounted for by 22.4%. Both variables added at this step correlate positively with the dependent variable.

Block 3 consists of variables related to subjective factors (difficulty in performing teaching roles, difficulty of adapting to distance learning, teaching professionals' satisfaction with their work). Of these, difficulty in performing teaching roles and difficulty of adapting to distance learning are negatively correlated with the dependent variable, while the teaching professionals' satisfaction with their work is positively correlated to the perceived effectiveness of distance learning teaching activities. These predictors are making a significant contribution to the model, leading to an increase in its predictive power. You can find further information on the regression analysis coefficients in Table 6.

**Table 6.** Regression coefficients for the dependent variable.

Variables	Model 1		Model 2		Model 3	
	Beta	SE	Beta	SE	Beta	SE
Grade level of teaching	0.522	0.374	−0.036	0.331	0.054	0.317
School location	−0.240	0.164	−0.123	0.145	−0.111	0.139
Gender	−0.160	0.233	−0.005	0.206	−0.086	0.198
Dummy age–under 30	−0.199	0.526	−0.270	0.464	0.057	0.446
Dummy age–31–40 s	0.041	0.491	0.068	0.433	0.347	0.416
Dummy age–41–50 s	−0.146	0.486	−0.127	0.429	0.006	0.411
Dummy age–51–60 s	0.009	0.503	0.101	0.443	0.193	0.424
Dummy level of education–high-school	−0.724	0.643	−0.524	0.566	−0.376	0.544
Dummy level of education–university studies (bachelor)	−0.343	0.341	−0.300	0.300	−0.364	0.288
Dummy level of education–postgraduate studies (master)	−0.068	0.350	−0.076	0.308	−0.149	0.295
Academic performance of the students			0.849 ***	0.069	0.568	0.081
Level of preparedness for distance learning			0.260 ***	0.037	0.151	0.037
Difficulty in performing teaching roles					−0.079 ***	0.013
Difficulty of adapting to distance learning					−0.097 ***	0.027
Teaching professionals' satisfaction with their work					0.192 ***	0.069

\*\*\* sig. < 0.01.

## 5. Discussion

### 5.1. Ad-Hoc Transformations

No one was prepared for the new formulas; it was learned on the fly.

The COVID-19 pandemic brought many changes in the educational process and forced teachers in the dramatic situation of rethinking their role and their function, as well as of re-evaluating their working tools, classroom strategies, and pedagogical instruments without prior training. Faced with this crisis, teaching professionals had to adapt along the way, sometimes to improvise, to correct, and adjust during the process, to actually reinvent themselves. The restrictions imposed by the government have put teachers in front of unexpected challenges, which is the reason why our research legitimately aims to probe the perceptions and representations that teachers in Romania have about the way they have dealt with professional challenges during the pandemic. Replacing classroom teaching (on-site system) with distance learning (online system) was a defending policy instrument, an urge response to the COVID-19 pandemic situation which did not diminish the quality of education because online teaching/learning is deficient in itself, but because various factors affected the efficiency of online education. When those factors are addressed by educational policies and practical measures, online education becomes not only efficient but also sustainable as a sample of valid instruction.

### 5.2. Quality despite Online Format

Distance education, new equipment but teaching professionals know that they must maintain quality standards. Training is still needed.

The most significant pressure consisted of ensuring a quality education in order to make learning valuable and successful, even virtually (Chan et al.) [82] (p. 4). Remote instruction is often being perceived not only as a derivative pathway of education, but also as a way of bringing lower academic outcomes, providing inferior learning experiences.

In order to dismantle these myths, the teachers had to make considerable efforts which resulted in high costs, including psychological issues and exhaustion. Online education and remote instruction implied the use of electronic specialized devices (computers, tablets, webcams, phones) and platforms for audio and video conferencing (Zoom, Google Meet, Skype, MS Teams, Webex). Our first hypothesis stating that the number of electronic devices owned by teaching professionals is negatively correlated with the difficulty they face in adapting to distance learning is validated by the results. The adaptability of teachers, their resilience, their ability to use equipment and platforms for which they had no formal training, allowed us to believe that research can be extended in the direction of the sustainability of online education. Nevertheless, we have noticed a series of problems related to the equipment (malfunctioning, outdated) and the internet connection (quality, speed, errors). The novelty of using the teaching platforms came with struggles and difficulties, affecting the degree of commitment and engagement in didactic activities. Impaired interaction and communication have generated phenomena such as the dramatization of the teaching act—the online lectures have the tendency of becoming a ‘one-man show’ (of the teachers), but with a paradoxical lack of audience, because the teacher no longer feels the presence of the ‘public’ when performing online. Limited by restrictive infrastructure, the educational act depends on the complexity, the number of devices and the teachers’ ability to use them creatively. This situation added wider constraints on the quality of teaching, documenting the structural gap and the obstacle for connection between people (Ferri et al.) [44] (p. 7). However, when online infrastructure works efficiently, the chance of online education to become equally efficient is likely to increase, thus leading to long term sustainability.

The second hypothesis is also validated, although the online teaching experience did not fall within the time established by other studies as necessary (Bailey et al.) [20] (p. 184); at least two years of online teaching experience are needed to mitigate statistically significant levels of expected challenges. Several issues are also revealed by different studies, strengthening the validation of data for Hypothesis 3, (Leacock et al.) [83] (p. 3), (Dimaculangan et al.) [49] (p. 325): the lack of skills in engaging in online teaching transactions, the lack of pedagogical know-how of technology related strategies, the resistance to the technology and the dissatisfaction caused by demotivation. Of course, a practical tackle of solving the situation will be initiating training for teachers in using platforms and digital resources. High self-efficacy improves work satisfaction and increases motivation and involvement in solving community problems (Hatos) [78]. In the future we have to reconsider formal education and training of the teaching professionals. Face-to-face classroom-bound practice proved to be obsolete. Teachers and stakeholders should embrace new approaches and different perspectives and skillsets, redefining educational acts and best practices (Leacock et al.) [83] (p. 9), adding new strategies to the traditional educational methods, being more and more creative (Poletti) [84] (p. 2). When teachers assess themselves as having enhanced competences in using software/internet, they perceive it easier to perform their teaching roles, even if they never taught online before 2020. Studies show there is a large majority of teachers (over 90%) (Marshall et al.) [85] (p. 48) without any online teaching experience. Again, this practical reality does not make online education problematic per se; when teachers become experienced in online teaching, the efficiency of online teaching is set to improve and when improvement happens, online teaching becomes sustainable as a proper method of training via online-facilitated means of communication.

### 5.3. Professional Satisfaction or How It Feels to Be a Teacher in Times of Crisis

Hypothesis 4 and 5 explore the relationship between negative affect of the teaching professionals and the difficulties they are facing in adapting to online learning and performing their teaching roles: how it feels to be a teaching professional. Furthermore, Hypothesis 6 investigates how academic performance is linked to teachers’ professional satisfaction and how it is shaping to the new context and conditions. The distinction between the ‘old generation’ and the ‘digital native’ one (König et al.) [64] is useful, since younger teacher are more skillful and have more confidence in their ICT skills (Hatos et al.) [39],

(Moorhouse et al.) [86]. This is not to say, however, that older teaching professionals are automatically excluded from the category of digitally-versed individuals; on the contrary, older teachers can learn how to become literate and efficient in online interaction and when this happens, the sustainability of online education will no longer be a theoretical construct, but a practical reality.

Adding the representation of students' academic performance and the perceived effectiveness of distance learning teaching activities (Hypothesis 7): the effective presence of the teacher seems to be essential. Concurrently, the effectiveness in online education is challenged by a higher drop-out rate, distance and social injustice burdening the efforts of a sustainable communication. Harsh as it is, this reality reflects one's capability to adapt to new teaching situations, not an inherent fault of online education. Online education is not onsite education and, in this respect, online education may have lesser chances to be accepted in the current situation (when, during the COVID-19 pandemic, people were neither ready, nor willing to adapt to online interaction); nevertheless, if people are willing to work as part of online-related communication and interaction, online education has a very real chance to become a long-term sustainable system across the globe.

This situation required not only specific knowledge and skills, but also confidence. Online teaching is not only a social construct during the pandemic, but a resilient form of professional survival in times of crisis. Teachers' self-efficacy, the entire area of affective-motivation, are all relevant factors in a new competence area. The non-predictable context increases anxiety and the vulnerability of the situation. Since one of the problems detected is weak motivation, increasing motivation is an objective that can be considered by educational policies. Support is needed in all forms: autonomy support, competence support, relatedness support. The blamed distance, even if more and more people insist on online education and not distance education, is perceived both by teaching professionals and by students as an obstacle in real communication. This is the reason why one can use the syntagm 'transactional distance', a term developed by Michael Moore in the 90's naming the structured, psychological and communicational distance between teachers and students. In Romanian teachers' view, the increasing transactional distance is one of the causes of academic inefficiency. It could be that students are more flexible using remote learning in order to build communities and to share with their families and teachers (Woodley et al.) [87] (p. 2) in a spontaneous way. Even so, in Romania teaching professionals are more affected by economic disparities and social injustice (rural versus urban). Romanian teachers made huge efforts to reduce these disparities and to maintain a stable communication. Digital divide, the gap, the uneven distribution of ICT skills and resources (Chan et al.) [82] (p. 121) affected the efficiency of education in Romania (H1), but the way distance learning was perceived, the consistent presence in online classroom, the promising results (H7 and H8) generated high satisfaction among the teaching professionals, despite shortcomings and deprivations. This was a confirmation of the idea that self-efficacy is a decisive resource for teachers obliged to adapt to online activity (König et al.) [64] (pp. 4–5) which leads, almost automatically, to the postulation of sustainability for online-based teaching and learning methodologies.

#### *5.4. Limitations and New Directions*

Some limitations of the study concern the explored area. On the first hand, since the respondents are all based in Romania, generalizations regarding other countries are limited, but not excluded, since many of them reportedly faced the same situation and with its corresponding issues. On the other hand, we are aware of the fact that we involved mainly subjects from primary and secondary cycles of education, teaching mostly humanities, and not so many teaching staff from the tertiary education system. It is assumed that their perception may be significantly different and online education throughout the entire spectrum of educational realities (from kindergarten to post-doctoral work) is a reality which still needs constant investigations. However, online education is very likely to

continue as a means of academic instruction, which—despite various criticism—may well establish its sustainability in at least some educational contexts.

New directions of research are highlighted by this study: exploring the effect of returning to the classical system after a long period of remote learning, as well as the teachers' perception of the changes that the experience of online education has on professional satisfaction—in both cases, however, investigating the sustainability of online education is vital for a proper assessment of how schooling and academic instruction was done during the COVID-19 pandemic.

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