Article

Online Education in the COVID-19 Pandemic—Premise for Economic Competitiveness Growth?

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Abstract: In today's context, marked by globalization and a growing recognition of interdependencies, there is a permanent change in the world's economic big picture. In this ever-changing environment, competitiveness is the key factor when it comes to passing the test of requirements on all levels. Obviously, competitiveness, in turn, is conditioned by several elements, one of which being the quality of the workforce. The current situation, strongly influenced by the presence of the SARS-CoV-2 virus, imposes new rules of conduct, and organizations must be inventive if they wish to survive in this period. As a basic pillar of competitiveness, education cannot and should not lag behind, as the transfer of knowledge must continue with or without COVID-19. The questions arise: Can online education train the younger generations and provide them with the skills they need in order to adapt to the labor market? Will 2020 be a reference year for a paradigm shift in education? In order to answer these questions, the present paper includes an extensive survey conducted in Romania among two samples of respondents, one made of 173 university professors and the other consisting of 732 students. The results presented in the paper indicate a high level of adaptation to the new teaching methods, among professors (84.4%) as well as among students (58.7%), with a high number of professors (51.4%) considering that online education can become an important factor in the development of society and in the enhancement of economic competitiveness (60.7%).

Keywords: online education; competitiveness; well-being; digitalization; skills; COVID-19

1. Introduction

Immanuel Kant stated that "a good education is the source of all the good in the world". Every nation aims at the well-being of its citizens. However, to talk about welfare, we need to consider both growth and economic development. In a market where competition is fierce, having a competitive advantage has become an asset. Any given entity wants to be competitive to succeed in this society, characterized by a profusion of information, increased dynamism, and an ever-growing number of demanding social actors and consumers. In other words, it is a growing challenge to meet the various requirements of the increasingly demanding segments. In this context, "education as an intellectual resource is the driving force of the modern society" [1]; the development of human resource skills is essential for the well-being of any nation.

Competitiveness—a word that is uttered more and more often at present, now that the national and international economic picture is influenced by many changes, such as regionalization, globalization, and, more recently, the challenges posed by the COVID-19 pandemic. What does it mean to be competitive? Is competitiveness a notion that can be applied in various fields, without being limited to competition? Can competitiveness lead to performance? If so, what does it take to be competitive? Is the human factor the key element from which to start? The answer is easy to anticipate, it is only necessary to

specify that the idea of competitiveness must be seen and analyzed in all its aspects. In other words, competitiveness is the result of a set of factors; it is the external form of the process that includes a series of elements that, only together, can lead to the final result. The relationship between education and economic competitiveness has been studied over time by many authors.

Although there is an opinion that the statement "test performance is the key to international economic competitiveness" (...) "lacks empirical support" [2], the idea that higher education has a positive impact on economic competitiveness is widely accepted [3].

According to Miloš Krstić et al., education, especially higher education, is a key factor in competitiveness and sustainable economic development [4], as it has a decisive role to play in economic competitiveness, be it local, regional, or national [5]. A very important aspect, however, in this respect, taking into account especially the experience of the last two years, is the need for developing population's digital skills. Related to this, Statista indicates, for the year 2021 in Romania, a rather low score when it comes to the country-level digital competitiveness—51.97, placing our country in the bottom section of the list of the 64 states in the ranking. By comparison, the first places in this list are occupied by countries such as the USA (100), Hong Kong (96.58), Sweden (95.19), Denmark (95.16), and Singapore (95.14), the last places being occupied by Mongolia (40.69) and Botswana (33). Romania's score on the global competitiveness index is also relatively low, with the latest available reports indicating a value of 64.36.

Development gaps among different countries are determined, among other things, by the importance given to education in each of these countries [6].

In this age of globalization, it is difficult for a nation to be competitive if human capital is not properly formed, with a focus on developing the skills needed in the workplace [7]. These human resource skills must be present at all levels. In order to be successful, several types of resources must be combined, of which human resources are crucial [8]. According to Sanjaya Lall, "the skills of the workforce at all levels" [9] is a key determinant of competitiveness. At the same time, special emphasis must be placed on the development of soft skills such as creativity, critical thinking, and adaptation to the specifics of different cultures, [10] all these being important for the development of entrepreneurial activities, which are considered the engine of any economy [11].

Therefore, education, especially higher education, has an important role to play in training the workforce [12], which leads to an increase in the productivity of companies and the economic competitiveness of a nation [13].

The structure of the article is as follows. The second part addresses the review of the literature, where, in Section 2.1., we find the presentation of the role of education in economic development, discussing, in particular, the relation between education and competitiveness. In this sense, we notice a very small share of expenditures allocated to research and development in Romania (about 0.5% of the GDP). Section 2.2. highlights the premises for the implementation of online education, also pointing out the key indicators of the particularities of the Romanian education system, where we currently observe a still high percentage of early school abandonment (15.3%, compared to 10.2% in the EU). The third section forwards the methodology of the survey, listing the 7 proposed objectives and the 14 variables studied. Mention is also made of the 10 cities' university centers where the questionnaires were distributed, of the particularities of the two samples studied (the sample of professors consisting of 173 respondents and the sample of students comprising 732 people), as well as of the structure of the questionnaire administered. The fourth part outlines the results of the research, depending on the ideas highlighted in this section, the limits of the survey being outlined, along with future research directions, taking into account the conclusions reached. This section shows a high level of adaptation to online education, especially among professors (84.4%), who also indicate that the experience of online education was a beneficial one (72.8%) in terms of digital skills acquired by students, pointing out the important role of online education for the future development of society (51.4%). This idea is also extrapolated to the sphere of competitiveness, the

opinion shared by a large part of professors (60.7%) and students (48.2%) alike being that education digitalization can greatly contribute to increasing economic competitiveness. The link between the proposed objectives and the results obtained is discussed in Section 5, the last part containing the general conclusions of the paper.

2. Theoretical Background

2.1. The Role of Education in Economic Development

Competitiveness is a broad notion that must be carefully analyzed; because it is encountered in various fields, it is the basis of individual performance or of various entities, being the one that leads to the progress of society. Specialists believe that being competitive means having market shares both on the domestic and the international plane. The World Economic Forum defines competitiveness, in The Global Competitiveness Report, as being made of "the attributes and qualities of an economy that allow for a more efficient use of factors of production" [14]. This definition is closely linked to the workforce. Therefore, a nation with a healthy and educated workforce will hold the key to development success.

In order to talk about competitiveness, we must also know the factors that underlie it, the factors that influence it. Therefore, we must see the link between competitiveness and economic growth, and between competitiveness and economic development, respectively.

The relationship between competitiveness and economic development is indisputable. Therefore, each nation must take into account the factors of competitiveness, must implement the various macroeconomic measures through instruments leading to prosperity. According to the WEF [14,15], competitiveness is based on a set of 12 well-defined pillars, each with a decisive role in the economy and well-being of any nation (Figure 1).
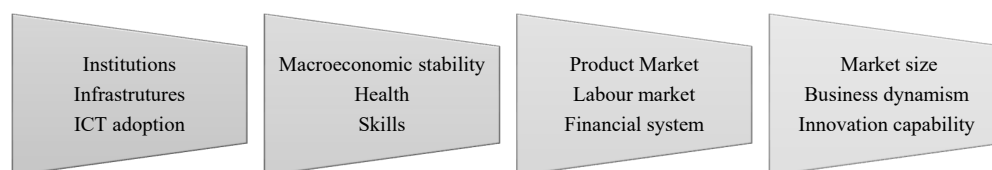
Institutions	Macroeconomic stability	Product Market	Market size
Infrastrutures	Health	Labour market	Business dynamism
ICT adoption	Skills	Financial system	Innovation capability

Figure 1. Pillars of economic competitiveness. Source: elaborated by the authors based on the data from the WEF Competitiveness Report [15].

As one can see, one of the basic pillars of competitiveness is constituted by skills. However, in order to build these skills, we need to focus on education. According to the Building a More Competitive Europe Report, since 2012, the key dimensions of the Europe 2020 strategy have been presented in the form of the seven pillars grouped in three main categories: Smart, Inclusive and Sustainable. Other sources [14] suggest that the Smart concept is based on four elements: the business environment, the digital agenda, innovation, and education and training.

According to Stiglitz and Walsh [16], the education system is the basis for human capital growth, and the quality of training and the acquisition of new skills by the workforce are now becoming increasingly important as competitiveness factors. When we talk about education, we must not omit research and development. Only if they are analyzed together and properly funded will they move the value chain positively for their nations.

The Europe 2020 strategy aimed at, among other things, allocating 3% of each member state's GDP to research and development. If we analyze the percentage of GDP allocated to research and development throughout the EU, we find that there is a positive relationship between its level and the living conditions it offers [17]. For 2019, Romania ranks last in terms of GDP percentage allocated for research and development, with almost 0.5%, closely followed by Malta (0.61%), Latvia (0.64%), and Cyprus (0.63%) (Figure 2).
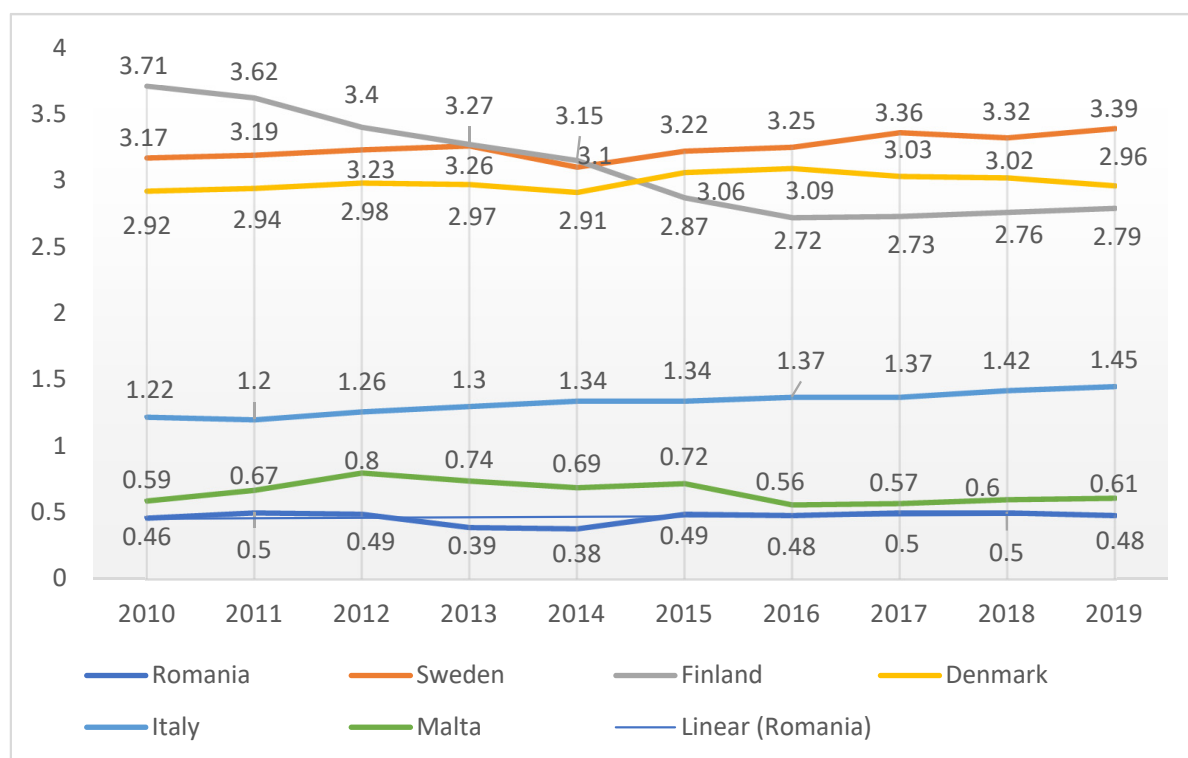
Figure 2. Gross domestic expenditure allotted to R&D—% (2010–2019). Source: [17].

At the top of the ranking, we find states that have long placed a special emphasis on education and research and development, which explains the high standard of living of its citizens. As a Chinese proverb says: "If you want a year of abundance, cultivate rice; If you want ten years of abundance, cultivate an orchard; If you want a hundred years of prosperity, cultivate people." It is well known that countries such as Sweden, Denmark, and Finland are not only at the top of the world in terms of technological advancement or innovation, but also provide more cohesive and sustainable living conditions, as well as more social protection, compared to other states (according to data from The Global Competitiveness Report) [15].

These states offer their citizens high living standards, being at the top of the rankings with the happiest people in the world, which confirms the results of investments in education and research and development. Very close to these countries, we encounter Austria (3.19%), Germany (3.17%), and Belgium (2.89%).

According to a UNICEF study [18], if investment in education is kept low, Romania will lose between EUR 12 and 17 billion between 2015 and 2025. It is necessary to increase investments in education by up to 6% of Romania's GDP in order to lead to higher economic growth. UNICEF studies (2020b) [19] also confirm that "an extra year of school increases income by 8-9%, reduces the risk of becoming unemployed by 8% and the occurrence of serious health problems by 8.2%. Graduates of upper secondary education earn 25-31% more than those who have completed primary and secondary education".

According to the strategy for education digitalization in Romania, "education is a fundamental right, and its access and quality must be guaranteed, regardless of how it takes place, be it physical, digital, or mixed" [20].

The controversies regarding the education issue have been amplified over the last year, in the context of seeing all the activity in this field transferred to the online environment, the trigger being the Coronavirus pandemic, itself so discussed worldwide.

According to a 2020 United Nations report [21], "before the pandemic, the world was already facing formidable challenges in fulfilling the promise of education as a basic human right". It is said that education is the foundation of society [22], and that the principles

and moral values [23] it transmits, along with the knowledge, play an essential role in shaping an individual's personality and, implicitly, in developing a community. We have an unpredictable future ahead, as long as "the evolution of the pandemic in the next period is marked by uncertainty" [24].

2.2. Towards an Online Education—Topicality and Premises

We cannot outline an objective picture of the current context without referring to past and present data, so as to see where we stand on the long and winding road of adapting to the requirements of the new reality. Discrepancies between states have always existed, and some of them remain, even if the gap is narrow in some cases. However, the context generated by COVID-19 has brought a persistent problem to attention: the need to hasten the pace of digitalization at the national level, a problem identified by the lack of digital skills of the population, which is a barrier to successful implementation of programs online learning [25].

Even if, during the pandemic, educational institutions were closed, universities have the duty to continue to provide education to those who are interested [26].

Different sectors of the economy as well as the government have various regulations and initiatives in place to support online education [27]. In order for this type of education to work properly, essentials, such as electricity, internet connections, smartphones or personal computers, are needed [28].

"Connectivity is critical in today's world" (UNICEF, 2020), but official reports indicate the following situation worldwide, in terms of the percentage of children and young people who have access to the internet from home [19] (Figure 3):
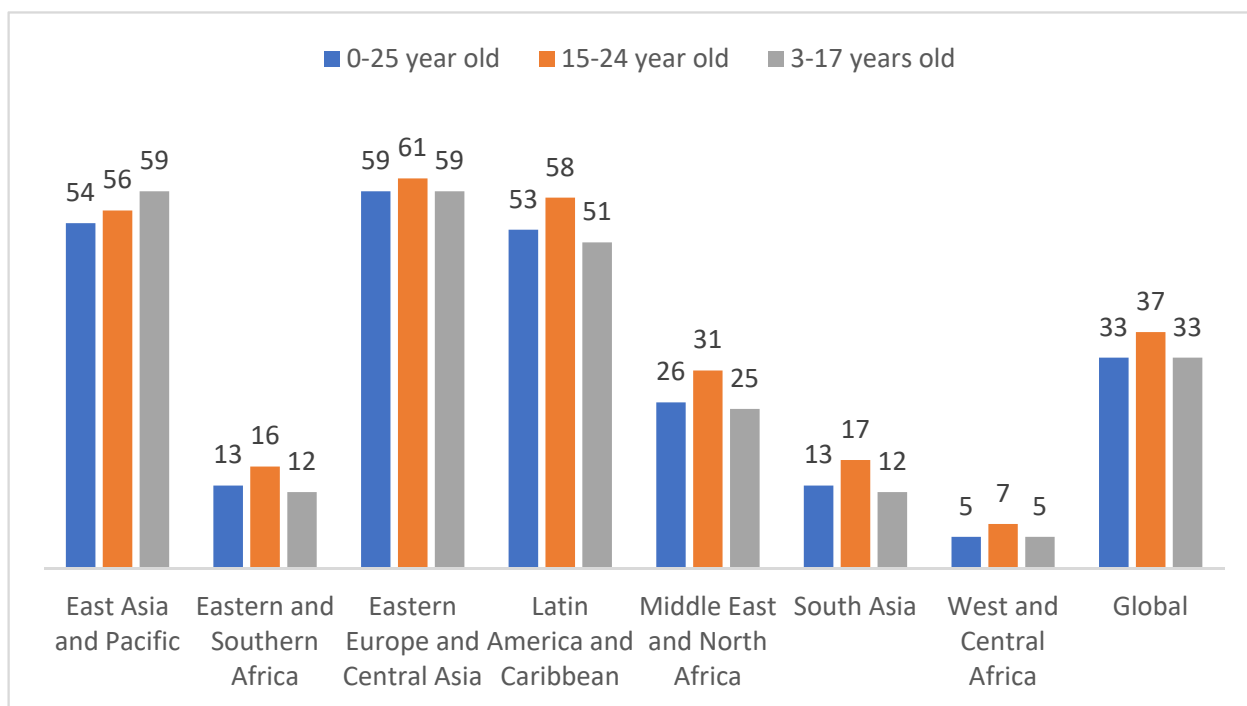

Figure 3. Children's and young people's access to the internet. Source: [19].

Eastern Europe and Central Asia are in a good position in this regard, with around 60% of children and young people having access to the internet at home. At the heart of a closer analysis lies a fundamental question—why do people learn? Or, in other words, what is their motivation for assimilating new knowledge? Alamettala et al. [25] indicate, in this sense, several directions, namely: personal expectations of an external nature, aspects of personal development or professional development, the desire to assimilate new knowledge, social contributions, etc.

At the same time, in order for online education to be successful, in addition to these material elements, other items are needed, such as student-focused learning, but also collaboration and the creation of formal and non-formal relationships [29]. Moreover, the development of professors' skills for the new paradigm represents the basic requirement for a successful education [30].

It is important to note that there are studies showing that certain pedagogical models of e-learning can help to identify entrepreneurial skills among students [31].

Even though this type of education is often a click away from students, online learning is not as simple as it sounds. Precisely because there is information profusion, students can get lost when the structure of a course is ambiguous. To facilitate learning, it needs guidance structures, structures that are necessary for the simple to the complicated course alike [32]. What is useful is to try to have synchronous learning sessions, because in this way, some doubts can be clarified [33].

Various digital platforms, such as Zoom, Microsoft Teams, and Google Meet have made it possible to carry out activities in this format. At the same time, along with these platforms, social networks were used [34], which has contributed to "bridging the gap" between professors and educators.

Sun and Chen identified eight aspects that need to be considered in order for online education to achieve its goal: "fostering relationships; engagement; timeliness; communications; organization; technology; flexibility; and high expectations" [35].

Although many authors have identified barriers to online learning [36], learning patterns [31], or other key elements for the success of online education [35], studies are still needed to know in detail how students learn online, thus adapting the necessary software for the optimal development of these activities [37].

For Romania, the reports indicate a constant phenomenon: university graduates are perceived as well prepared in terms of theoretical content, but in terms of "vocational and educational skills", there are significant gaps, which is considered to have been due, on the one hand, to an "outdated (...) infrastructure, and on the other hand to the outdated teaching methods", which are not adapted to the new generations.

The Education and Training Monitor, developed by Eurostat [38,39], indicates in Romania a percentage of 16.4% and 15.3% in 2018 and 2019, respectively, in terms of early school dropouts. By comparison, the EU average for the same years was 10.6% and 10.2%, respectively. Other key indicators listed in the Eurostat reports are: the share of higher education graduates aged between 30 and 34 (where, in the case of Romania, we can see a percentage of 24.6% in 2018 and 25.8% in 2019, compared to the EU average—40.7% and 40.3%, respectively); the participation of adults (25–64 years old) in the lifelong learning process (0.9% in 2018and 1.3% in 2019 in Romania, compared to 11.1% in 2018 and 10.8% in 2019 in the EU).

According to the Digital Economy and Society Index (DESI) [40], online courses are today considered (before the pandemic) "unpopular" in Europe, with a greater emphasis in Sweden and Finland on such activities. Other previous studies (for example, European Area of Skills and Qualifications, elaborated in 2014) mention a low level of satisfaction of individuals in the ability of online education to generate positive results. Thus, it becomes interesting to make a comparison between the results previously published in official studies and those obtained in the current context, when the online environment has become the only solution to ensure the continuity of education in safe conditions [41].

More recent papers reconsider this idea, that is, the need to develop online education as a result of pandemic conditions leading to performance levels similar to traditional education, through the appropriate use of the facilities offered by educational platforms by professors and students alike [42].

Half a decade ago, only 13% of Romanians believed that they could follow online education programs, while 21% said they were satisfied with the results obtained in such a context. A much higher percentage (59%) considered online as an inappropriate option. Given that all courses have been transposed online since March 2020, without a serious

and experienced history in this regard, education at the national level, according to Smart Edu [20], has gone through a difficult period, characterized by: a lack of predictability; gaps between urban and rural areas, territorial units, schools, classes, and individuals; a low level of digital skills; and problems with access to electronic devices and an internet connection.

Based on this information, we forward the following research questions:

RQ1. Is the process of adapting to the online teaching system difficult, and does it require strong national support?

Is it possible, however, for online education to generate good results? This question was asked before the pandemic, questioning the usefulness of online education and its ability to create value. We will now have the opportunity to see which of the two systems creates better results, based on a sufficiently complex and long-lasting experience, given that the vast majority of education systems worldwide have experienced the implementation of online teaching at the same time.

Online education offers the possibility of bringing together, at the same time and in the same place (virtually), a much higher number of people, and it requires fewer resources from the state, which should be an advantage, especially since it offers the opportunity to participate from various corners of the world. On the other hand, disruptions in the provision of educational services to learners, such as those caused by the pan-demographic situation, can lead to delays in the formation of leaders and human capital skills, with repercussions on the economy [43].

However, technology progresses annually and at a rapid pace, which requires the high adaptability of individuals, regardless of age, creating connections with the quality of life [44]. The educational field has also gradually integrated learning platforms [45], which will help facilitate the transmission of information; however, while before the pandemic, they were used more in isolation and only voluntarily, the need imposed the adoption of this way of working and the generalization of the particular, transforming it into a unanimous model. Regardless of the constraints, however, we can currently talk about various forms of online education, starting from special platforms dedicated to pupils or students, to online educational games, groups, communities, sites that offer online tutorials, courses and programs offered without frequency, MOOCs (Massive Open Online Courses) [46], etc., through which the distance between the information provider and its beneficiary is greatly reduced. The dilemma remains whether the results obtained in the online system are sufficiently relevant and objective, compared to the traditional system.

E-learning, certainly, like the traditional learning system, has its pros and cons, namely, challenges [47] as well as a higher or lower levels of attractiveness [48], depending on the individual. Thus, the dilemma remains whether the results obtained in the online system are sufficiently relevant and objective, compared to the traditional system. Given the barriers represented by technology, interpersonal contact is limited, and specific skills are needed, so online activities are sometimes seen as lacking in practicality and in some cases even demoralizing or demotivating [25].

As a result, a more careful approach to this issue is needed at national level, given that strategic directions on online teaching are currently lacking.

RQ2. Is online education more attractive and flexible? Are the results obtained questionable, in the absence of a coherent strategy?

Globally, the news of the onset and then rapid spread of the Coronavirus was received with fear and shock. Every aspect of life felt the impact, to a greater or lesser extent, and in some areas, adaptation has been achieved along the way; but how prepared the states were for the total transition of education to the virtual environment is a wide discussion, and Romania is no exception in this regard, with the COVID-19 "tornado" coming "abruptly with little or no preparation plan in place in some developing countries" [49]. This highlights the lack of resources, large infrastructure deficit, problems regarding the content of the disciplines taught, as well as others of the nature of cyber security.

The socio-economic impact is very strong, and even though more than a year has passed since the beginning of the pandemic, with a general recalibration, flexibility, and adaptation being tried in the meantime, some sectors remain affected, and the effects are estimated to exist at least in the medium term. One cannot overlook the general earthquake in the economy, nor the rising unemployment or the loss of jobs, all of which are reflected as social consequences [50].

According to economica.net and studies conducted by UNICEF [18,19], Romania is at the bottom of the ranking in the European Union in terms of investments in education. How can such performance be achieved without a thorough preparation of the general framework? How prepared was Romania for adapting to online education? How well has it adapted and what will be the consequences in the future? The link between human capital and economic growth was discussed by Schultz and Becker, who indicate the following as main factors influencing human value: health, job opportunities, education, training programs, etc. [51].

Certainly, in the context of the health crisis, a crisis of education has been amplified, which requires us to re-evaluate the current level of efficiency of the teaching system. Logically, a question emerges: "What will happen when the pandemic ends?", complemented by specialists [52] with two other dilemmas: "What will the consequences be globally and nationally?" and "What influences will the long-term pandemic have on the quality of human life, on lifestyle, on learning?", especially in the context in which all these aspects are connected with the notion of well-being [53] and economic development, respectively [54].

Muilenburg and Berge identified eight factors that can be considered barriers to online learning: "administrative issues, social interaction, academic skills, technical skills, learner motivation, time and support for studies, cost and access to the Internet, and technical problems" [36].

RQ3. Will online tools continue to be increasingly integrated into the teaching process, even after the end of the pandemic?

Among the problems revealed by the Coronavirus pandemic, we may list the following, according to UNICEF, PwC, and Generation Unlimited [18]: the inequality of opportunity in education, the problem represented by the low level of digital skills, both among students and professors; the reduced access of students to learning infrastructure; and problems with internet connection. There are still underdeveloped areas, where a major gap can be seen between rural and urban students, generating a high dropout rate. Thus, the main weaknesses in the system were highlighted, at the level of all the world's economies, given that all children should have equal access to education [55].

Țoc and Florian (in [52]) raise "the issue of equity and equal access to education in the context of online educational activities, given that in Romania about 18% of the population aged 16-74 did not use never the Internet".

All the more so since, as the degree of dependence on technology has increased over the last year, the problem of the lack of electronic devices necessary for individual study arises, with this facing pupils and students from most countries. OECD member states point to this, along with "another common problem", namely, the lack of a "quiet place to study at home" [56,57], which is faced by "an average of 9% of 15-year-olds", especially those in disadvantaged areas (economica.net). Even if, at the European level, the percentage of pupils/students with access to electronic devices is very high, Romania is currently below the average of OECD countries, with only 75% of students living in disadvantaged areas having the opportunity to use such a device.

According to the Education and Training Monitor [38,39], developed by Eurostat, "only 57% of young Romanians aged 16 to 19 have basic digital skills or above average", given that, in the European Union, the average is 82%. We find, therefore, a deficit of digital infrastructure, especially in rural areas, where a significant gap can be observed compared to schools in urban areas. However, it is not enough for technology to be available, "it must also be adequate" [58], as e-learning platforms need to be both efficient and available.

RQ4. Are individual skills and performance, acquired through online education, dependent on the existence of appropriate devices and individuals' ability to use them?

It becomes necessary to consolidate the investment policy in education and training; currently, the expenditures on education are, in the case of Romania, "among the lowest in the EU". This requirement is directly related to the modernization of teaching techniques and education in general, given that the need to adapt to new labor market requirements is expected. The literature emphasizes the decisive influences of public spending on education on the level of development of a country [59], highlighting the link between education and economic growth [60]. However, according to the Strategy of Educational Digitalization in Romania, "it is extremely important for every person to invest in their digital skills throughout life" [20], improving education and skills.

Eurostat establishes the link between labor productivity, innovation, and competitiveness at national level, and given that Romania does not register satisfactory results in the case of specific indicators (percentage of graduates, doctoral graduates, holders of skills, etc.), we will not be able to talk about economic development at the expected level. Investment in education is considered to be "essential" [18] for "building social cohesion and in reducing the unsustainable inequalities that are blocking human development and economic growth" (as per Antonio Guterres's statement, 2020).

The ICCV's social report for 2020 [24] on living standards in the context of the pandemic identifies Romania as "an extremely vulnerable society in crisis situations", a not at all honorable feature deduced from the analysis of data on public revenues and expenditures, or the "financing level of public services, especially health and education, with a major impact on the quality of life and the decision to emigrate", namely, the number of public sector employees in relation to the population and the total number of employees. The general picture is completed by the characterization of the labor force as "cheap" and "poorly qualified", in the conditions in which the specialized literature draws direct connections between the quality of education and the level of earnings of an individual [61].

According to the study on the opportunity to make the way and time of work in the Romanian public administration more flexible, carried out by the National Institute of Administration [62], we cannot ignore the fact that "the pandemic forced all member states to make the switch and start working from home", which poses new challenges.

In comparison, the share in GDP of the remuneration of employees at the level of the European Union shows the following (Table 1):

Table 1. The share in GDP of the remuneration of employees, 2008–2019. Source: Eurostat [17].

Year	France	Germany	The Czech Republic	Hungary	Poland	Romania	Bulgaria	EU28
2008	50.7	49.1	40.2	45.3	38.7	36.3	33.6	47.0
2009	52.3	51.4	39.9	45.0	37.7	34.2	35.3	48.3
2010	52.1	50.4	40.2	43.8	37.9	35.9	36.5	47.8
2011	51.9	50.1	40.3	43.7	37.1	33.2	35.4	47.4
2012	52.3	51.1	41.0	44.7	37.2	32.7	36.8	47.6
2013	52.4	51.4	40.9	43.8	37.3	31.8	39.7	47.6
2014	52.4	51.3	40.2	42.8	37.6	32.8	40.8	47.4
2015	51.9	51.6	39.6	42.0	37.1	32.3	40.9	47.0
2016	52.1	51.8	40.4	43.2	38.2	35.2	41.4	47.2
2017	52.2	52.2	41.4	43.4	38.5	37.1	42.6	47.2
2018	52.4	52.9	43.0	42.9	. . .	38.5	44.0	47.6
2019	51.5	53.8	43.4	43.2	. . .	38.2	43.8	47.9

We can see that, in the EU, the average value does not change very much, standing at around 47% over the period 2008–2019. Above the EU average, in this respect, we find countries such as France and Germany; we find a much lower level in the case of Hungary, the Czech Republic, Poland, Bulgaria, and Romania. In the case of our country, the percentages fluctuate from one year to the next, the highest percentage value corresponding to 2018.

The present study, therefore, proposes a conceptual research map as follows (Figure 4):
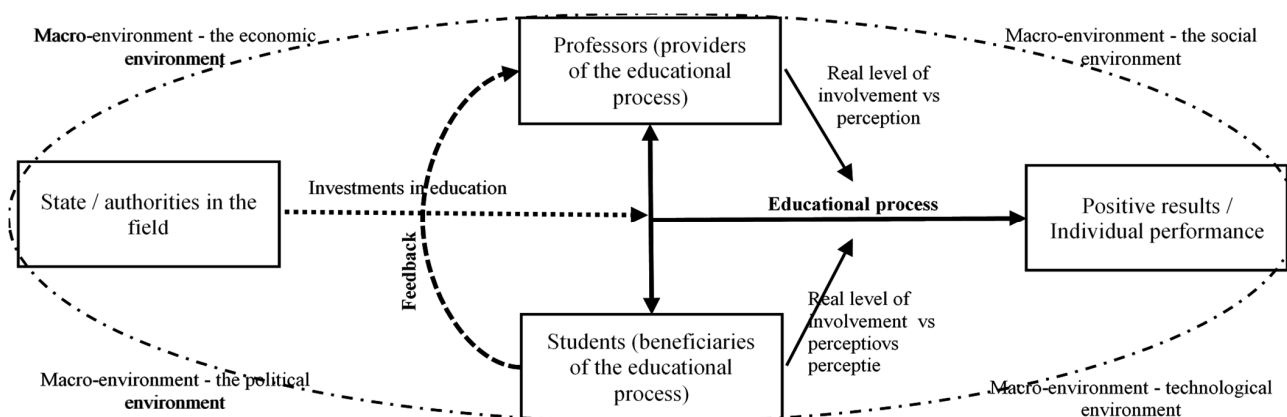

Figure 4. Research map. Source: elaborated by the authors.

3. Materials and Methods

3.1. General Context of the Study Conducted

In order to study the perception of university professors, as well as that of the students, regarding the particularities of online education in the Romanian university environment, we used a questionnaire-based survey as our research method. According to the literature, the investigation is one of the complex methods of psychosociological studies. This method involves collecting information, most of which, with the help of interviews and/or questionnaires [63], is based on a certain sample of the researched population, and the results obtained from this investigation can be generalized. Based on these considerations, the main tool of this research was an online questionnaire, applied through a form drawn up in Google Forms. This method of application was dictated, especially, by the current context generated by the presence of the SARS-CoV-2 virus, a situation that led to the need to limit physical contact. The questionnaire was administered between May and July 2021.

As regards the context in which the instrument was applied, it is important to note that all respondents participated in online teaching–learning activities during its application period and in the pre-trial period, given that the Coronavirus pandemic forced education to reorient itself towards identifying the best solutions in order to ensure the continuity of the educational process in conditions of efficiency and safety.

The participation in the educational process under the conditions offered online, since March 2020, allowed respondents to formulate relevant opinions on the advantages, disadvantages, development prospects, and usefulness of the methods used, the subjects being directly involved in this process, being also witnesses and actors of this process of change implemented in a relatively short time.

The subjects who answered the questions in the two questionnaires belong to several university centers; among the cities of origin we can list Resita and Timisoara, Arad, Oradea, Cluj-Napoca, Craiova, Sibiu, Bucharest, Iasi, and Suceava, with some of these locations being represented by two or three university centers each. Both public and private universities were included in the list of universities. The media coverage of the questionnaires was accomplished with the help of e-mail in the case of the sample of professors, as well as with the help of the representatives of the Students' League, in the

case of students, in order to collect as many answers as possible, even if they turned out to be heterogeneous as regards the universities of origin.

The collection of the answers was performed in a controlled way, so that only the respondents from the university environment could fill in the answers to the questions. In addition, in order to increase the level of security, the possibility to complete the answers was conditioned by the connection with the institutional email, the respondents having the possibility to complete the questionnaire only once.

The respondents, both professors and students, covered a wide range of specializations, the online activities referred to by the answers given being both theoretical and applied. Reference was made to both course and seminar activities, as well as to extracurricular activities, with applicative character. Most of the didactic activities referred to were carried out with the help of online support applications, of which we can mention some as examples. Thus, depending on the specifics of the classes, subjects, or taking into account the policies adopted at institutional level, the platforms used were: Moodle, Zoom, Microsoft Teams, Edmodo, Skype, and Google Classroom, the activity carried out with their help being adapted, taking into account of the particularities of each subject.

3.2. The objectives of the study, the sample analyzed, and the content of the questionnaires applied

The main objective of the research was to study the connection between online education and the increasing economic competitiveness. The secondary objectives consisted of:

- OS1. Identifying the level of adaptation to the specifics of online education;
- OS2. Identifying the degree of demand and attractiveness of online teaching activities;
- OS3. Identifying the positive and negative aspects of online education;
- OS4. Identifying professors' level of involvement in extracurricular and research activities, in the context of online education;
- OS5. Identifying the level of skills acquired through online education;
- OS6. Assessing the perspectives of online education, starting from the current context;
- OS7. Studying the perception of online education vs. traditional education.

To achieve these objectives, two questionnaires were designed and distributed online: one for university professors, consisting of 27 questions, of which 4 were identification questions and 23 were content questions; and another questionnaire for students, consisting of 25 questions, of which 6 were identification questions and 19 were content questions. The structure of the two questionnaires was similar in terms of questions, except for a few specificities related to the activity of professors or students.

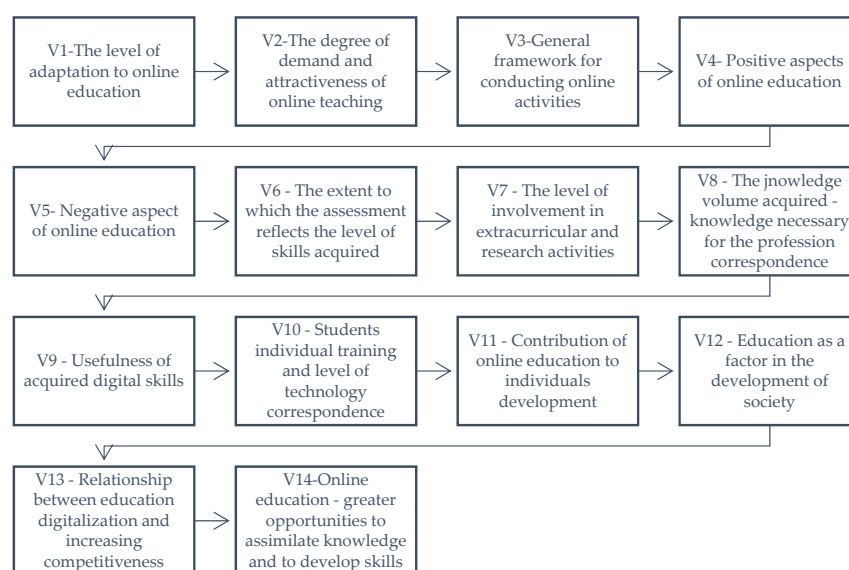The variables studied were (Figure 5):

Figure 5. The variables studied. Source: own research.

In the study, several research questions were proposed, in connection with which the answers provided by the surveyed subjects were subsequently analyzed. Each question in the two questionnaires identifies a studied variable, which is related to a proposed secondary objective. Following the centralization of the answers, a verification of the results obtained was performed at the end of the paper, and descriptive statistical indicators were calculated. At this stage, only the level of homogeneity of the answers, in the case of Likert-type questions, was verified by calculating the coefficient of variation and the standard deviation, while opening new research directions, in order to deepen the studied problem.

The design of the research is presented in Appendix A.

In the case of professors, the identification questions focused on gender, age, teaching degree, and the fundamental field of doctoral studies, and, in the case of students, these questions took into account gender, age, place of residence, occupation, level of education, studies, and the fundamental field of university studies. The structure of the questionnaires was complex, comprising both closed questions, with single or multiple answer options, and questions based on measurement scales, the respondents giving a score for the proposed criteria, according to Likert's scale, from 1 to 5. The sample of subjects was composed of 173 university professors and 732 students, with the following distribution (Table 2):

Table 2. The sample of subjects. Source: own research.

Criterion	University Professors			Students		
	Total Number of Respondents	Variables	Percentage	Total Number of Respondents	Variables	Percentage
Gender	173	Male	40.5%	732	Male	24.5%
		Female	59.5%		Female	75.5%
Age	173	under 35 years	9.2%	732	under 24 years	73.9%
		aged 35–44	34.1%		aged 25–34	13.7%
		aged 45–54	34.7%		aged 35–44	7.4%
		aged 55–64	19.7%		aged 45–54	4.8%
		over 65 years	2.3%		aged 55–64	-
					over 65 years	0.2%
Teaching degree	173	Assistant lecturer	6.9%	732	*** not applicable	
		Lecturer	28.9%			
		Associate Professor	41.6%			
		University Professor	20.2%			
		External Associate Professor	2.4%			
Fundamental field of doctoral studies (University professors)/Field of studies (bachelor's, master's, doctoral) (Students)	173	Social sciences (law, administration, communication, sociology, political sciences, military sciences, economics, psychology, behavioral sciences)	80.9%	732	Social sciences (law, administration, communication, sociology, political sciences, military sciences, economics, psychology, behavioral sciences)	68%
		Biological and biomedical sciences	1.8%		Biological and biomedical sciences	6.3%
		Engineering sciences	6.9%		Engineering sciences	8.3%
		Mathematics and natural sciences	4.6%		Mathematics and natural sciences	5.5%
		Humanities and arts (philology, philosophy, history, theology, architecture, urbanism, arts)	3.5%		Humanities and arts (philology, philosophy, history, theology, architecture, urbanism, arts)	6.3%
		The science of sport and physical education	2.3%		The science of sport and physical education	5.6%

Table 2. *Cont.*

Criterion	University Professors			Students		
	Total Number of Respondents	Variables	Percentage	Total Number of Respondents	Variables	Percentage
Level of studies	173	*** not applicable		732	Undergraduate students	81.1%
					Master's students	18.3%
					Doctoral students	0.6%
Residence	173	*** not applicable		732	Urban	69.7%
					Rural	30.3%
Labor market status	173	*** not applicable		732	Integrated with the labor market	38.7%
					Not integrated with the labor market	61.3%

From the table above, we remark on the structure of each of the two samples studied. Among the stated characteristics, we consider it important to point out some socio-demographic features. Thus, in terms of the sample of professors, out of the 173 respondents, the share of women is higher—59.5%, while men represent 40.5% of the total respondents. The largest share is held by people aged 45 to 54 (34.7%), a percentage very close to that of professors aged 35 to 44 (34.1%). Respondents under the age of 35 represent 9.2% of the total number of respondents, while the age group 55–64 represents 19.7% and the category over 65 years—2.3%. These percentages can be correlated with those related to the teaching degree. Thus, the university assistant lecturers are represented in a percentage of 6.9%, the lecturers—28.9%, the associate professors—41.6%, and the university professors constitute 20.2% of the total. Only 2.4% of respondents represent associate professors.

The largest share of the total respondents is represented by persons with a PhD in social sciences (including various fields such as law, administrative science, communication, sociology, political science, economics, military science, psychology, and behavioral science), while 6.9% have PhDs in engineering, 4.6% in mathematics and natural sciences, 3.5% in history and arts, and 2.3% in physical education and sports.

As for the sample of students, the structure by gender shows the following distribution: 24.5% men and 75.5% women. Of these, 73.9% are respondents under the age of 24, 13.7%—people between 25 and 34, while the age group 35–44 is represented in a proportion of 7.4 %, the 45–54 age group—4.8%, and students over the age of 65 represent 0.2% of the total respondents. The distribution by fields of study shows that 68% of the students who answered the questions in the questionnaire belong to the field of social sciences, 6.3%—biological and biomedical sciences, 8.3%—engineering sciences, 5.5%—mathematics and natural sciences, 6.3%—arts and humanities, and 5.6%—physical education and sports. A total of 81.1% of the students who answered the questionnaire come from undergraduate degree programs, 18.3% from master's degree programs, and 0.6% are doctoral students. Depending on the environment of residence, 69.7% of students come from urban areas, and 30.3% come from rural areas; 38.7% are also employed and 61.3% are not engaged in any activity on the labor market.

4. Results

From this point on in the paper, instead of the expression "member of the university teaching staff" the generic notion of "professor" will be used.

Regarding the degree of adaptation to the particularities of online education, the vast majority of university professors (84.4%) say that they have adapted to a large or even very large extent, with the percentage of those who say they have adapted to a small or very small extent in online education being only 3.5%. It is noted that the percentage of students who claim to have adapted well and even very well to the specifics of online education, although high (58.7%), is much lower than that recorded, in this regard, in the case of professors (84.4%). Moreover, the share of students who specify that they have adapted to

a small and very small extent to online education (12.4%) is still quite high, much higher compared to that of professors (3.5%) (Figure 6).
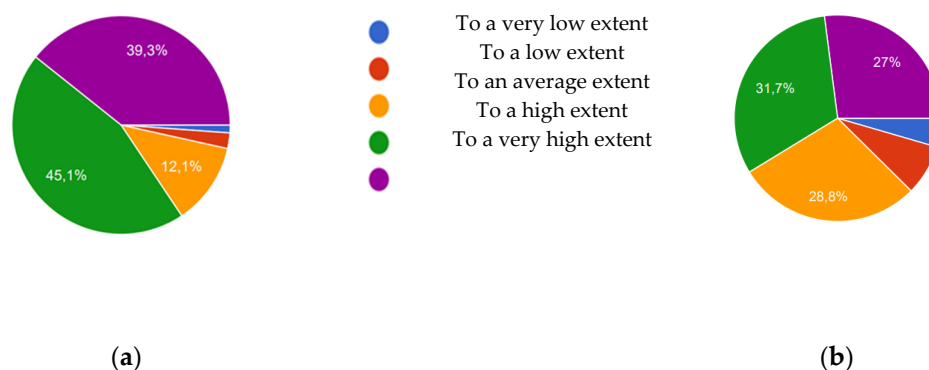

Figure 6. Degree of adaptation to online education ((**a**) professors, (**b**) students). Source: own research.

There are quite large discrepancies between professors and students, and in terms of the device from which they connect, in general, to teaching activities. Thus, if 95.4% of professors use a laptop/PC, 2.9% connect from a tablet and only 1.7% usually use a phone in teaching activities; in the case of students, the percentage of those who connect from a phone is much higher (37.8%) than professors. However, the majority of students (61.2%) use their laptop/PC in learning activities, and only 1% use a tablet.

In terms of the demand degree, almost three-quarters of university professors (74%) consider online teaching as more demanding compared to classroom activity, 18.5% believe that both types of activity require approximately the same degree of demand, and only 7.1% of professors say that the online activity is less demanding compared to the traditional teaching activity.

Regarding the degree of attractiveness of online activities for students, most professors (60.1%) consider that this way of carrying out teaching activities is less attractive than the traditional educational activities, 26.6% consider that both ways can be the same, and only 13.3% of professors say that online teaching activities are more attractive to students than those in the classroom. In their turn, a little more than half of the students state that the online teaching activity is more demanding and/or less attractive than the traditionally carried out activity (Figure 7).
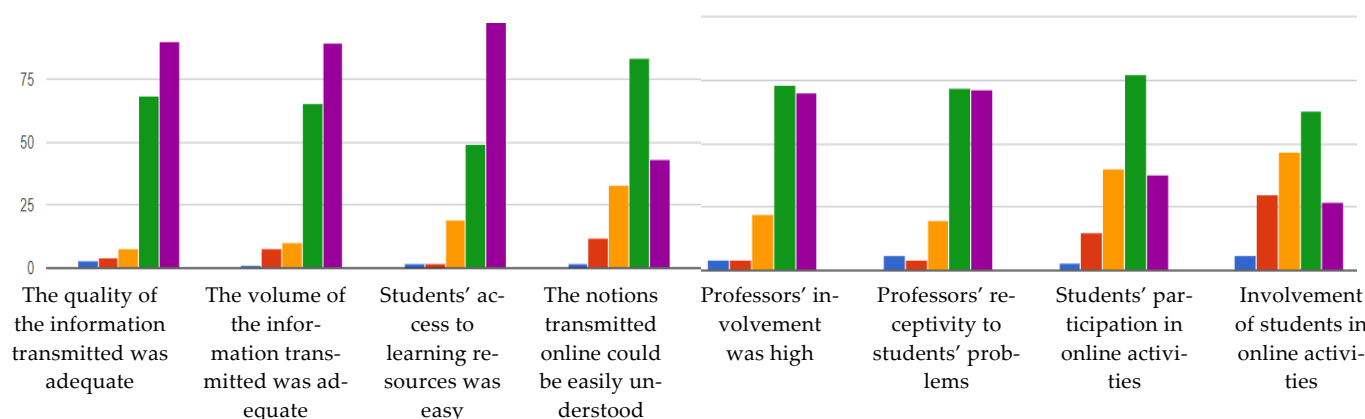

Figure 7. The agreement or disagreement expressed by professors on certain aspects of online education. Source: own research. Legend: blue—total disagreement; red—disagreement; yellow—neutral; green—agreement; mauve—total agreement.

Most university professors consider that both the quality and the volume of information transmitted in the online environment were appropriate to the objectives and specifics

of the disciplines. At the same time, professors consider, to an even greater extent, that students' access to learning resources in the online system was easy. In considerable numbers, professors say that, according to the feedback obtained from students, the notions transmitted online could, as a rule, be easily understood. Professors consider that their involvement in conducting online activities, as well as their receptivity to students' problems, were generally high.

Although in a lower percentage than in the case of professors, students also appreciate that, in general, both the quality and the volume of information transmitted in the online environment were appropriate to the objectives and specifics of the disciplines, and their access to learning resources online was easy. In addition, most students state that professors' involvement in conducting online activities, as well as their receptivity to students' problems, were generally high (Figure 8). On the other hand, although most students say that the information received online could, as a rule, be easily understood, the number of those who say they did not understand the notions received in this system so well is quite high. The answers are quite divided when it comes to participation and, especially, the involvement of students in online teaching activities, and many are both those who agree and those who express disagreement with the statement that, "in the online environment, student presence and/or involvement was high".
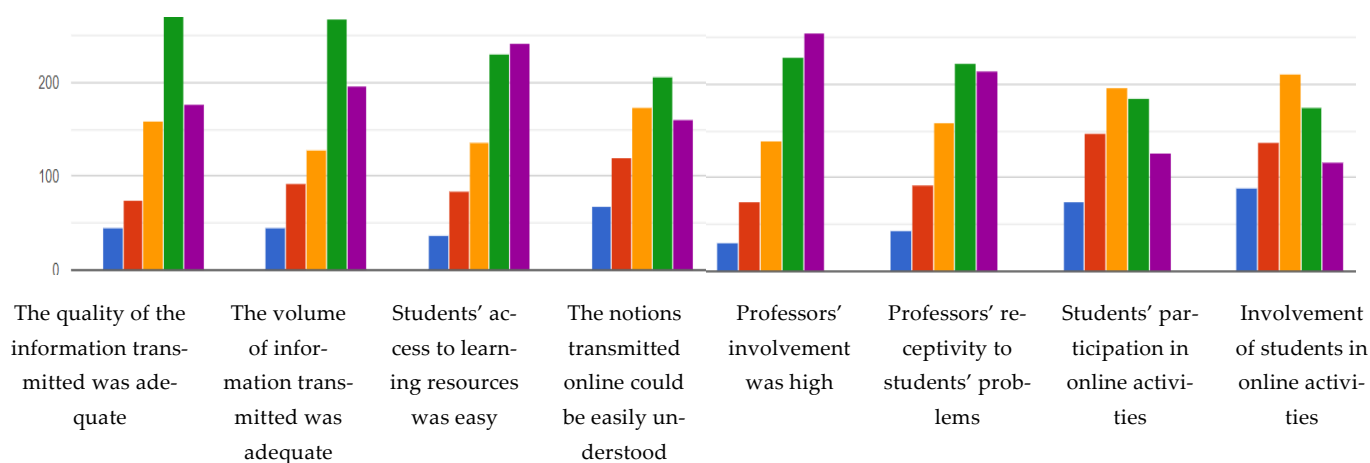

Figure 8. The agreement or disagreement expressed by students with certain aspects of online education. Source: own research. Legend: blue—total disagreement; red—disagreement; yellow—neutral; green—agreement; mauve—total agreement.

As regards the extent to which online education can offer greater or lesser possibilities than traditional education to assimilate knowledge and train skills, most professors (38.7%) believe that both forms of education can equally contribute to build the skills that students need. It should be mentioned that 36.4% of professors believe that online education cannot contribute to the same extent as traditional education to the assimilation of knowledge and skills training. On the other hand, 24.9% of professors say that online education can contribute even more than traditional education to the training of students' skills. In turn, most students (42.9%) believe that online education cannot contribute as much as traditional education to the assimilation of knowledge and skills training. Only 23.5% of students believe more in the possibilities of the online, compared to the traditional system, to shape the skills needed by students, and the remaining 33.6% appreciate that both systems offer the same possibilities to students, in terms of assimilating knowledge and training skills.

When it comes to the benefits of online education, most professors consider that the main advantages are: flexibility, the ability to participate in teaching activities from anywhere, the development of skills to use various platforms and devices, the access to many information resources, and even the encouragement of the creativity and innovation of professors. Only 0.6% of professors appreciate that online education does not bring

any positive aspect. Students are generally of the same opinion, most of them claiming that the main advantages of online education are: flexibility, the ability to participate in learning activities from anywhere, the development of skills to use various platforms and devices, and the possibility of accessing numerous information resources. It should be noted, however, that 6.7% of students consider that there are no positive aspects of online education. Regarding the negative aspects of online education, most professors declare that these are, in general, the following: the great amount of time spent in front of a device (phone, tablet, laptop, PC), the difficulty of maintaining student motivation, creating an impersonal educational climate, as well as the very high demand for online activity. Beyond all this, there are also professors who consider that there is no negative aspect of online education (3.5% of respondents). On the other hand, the biggest negative aspects of online education, in the students' view, are: the great amount of time spent in front of a device (phone, tablet, laptop, PC), the quality of the internet connection, maintaining students' motivation, and creating an impersonal climate of education. It should be noted that, even in the case of students, there are respondents who consider that there is no negative aspect of online education (7.5%), their percentage being even higher than that recorded in the case of professors.

The transition to online teaching has generated many challenges, including the volume of knowledge transmitted by professors and mastered by students. A total of 41% of professors consider that, "to an average extent", the volume of knowledge acquired online by students is sufficient/appropriate for their profession. On the other hand, 48% of professors appreciate that the volume of knowledge acquired online by students is obtained to a large and even very large extent, and for 11% of them, this volume of knowledge is acquired to a small and/or very small extent (Figure 9).
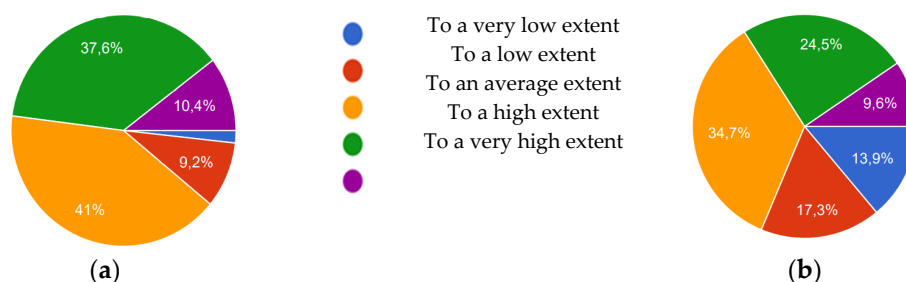

Figure 9. The extent to which the amount of knowledge acquired online is appropriate for the future profession of the students ((**a**) professors, (**b**) students). Source: own research.

It is remarked that the percentage of students who claim that the volume of knowledge acquired online is sufficient/appropriate for the profession in which they are trained is 34.7% on average, compared to the average of professors, which is 41%. At the same time, 34.1% of students consider that, to a large and/or very large extent, the volume of knowledge acquired online is sufficient/appropriate for the profession in which they prepare and, on the other hand, 31.2% of students choose the options "to a low extent" (17.3%) or "to a very low extent" (13.9%).

The role of tertiary education is to train specialists for many fields. A total of 72.8% of professors consider that the various digital skills acquired during this period by students will be very useful to them in their professional activity. In a proportion of only 2.3%, professors believe that, only to a low extent, the various digital skills acquired will be used by students in their future work, and the "to a very low extent" option is not even taken into account by professors, because they do not conceive that today's students do not have digital skills. As for students, their perception of the acquisition of digital skills and their usefulness in future didactic activities is slightly different, in the sense that only 46.2% agree—to a very high extent (14.9%) and to a high extent (31.3%)—that they will be useful to them. However, 7.7% and 11.3% of students appreciate that the various digital

skills will be useful for their future educational activity to a very low extent and to a low extent, respectively.

Future trades and professions will have the capacity to create new jobs, and people will work less physically in them, but will work in a smarter manner. It is appreciated that 70.5% of professors say they totally agree (20.2%) or at least agree (50.3%) that the level of preparation of students acquired through online courses corresponds to the trend of technology intensification and adaptation to the trades of the future. In a very small percentage of only 6.4%, disagreement is expressed regarding the existence of a correspondence between the training of students and the intensification of digital technology or the emergence of new trades (Figure 10).
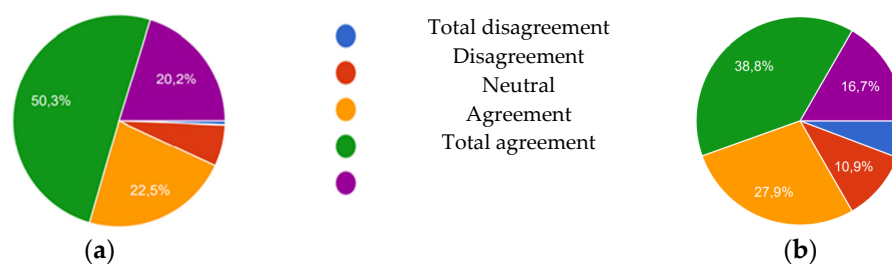

Figure 10. The level to which online training corresponds to the trend of technology intensification and adaptation to the professions of the future ((**a**) professors, (**b**) students). Source: own research.

The total disagreement variant was noted by only 0.6% of professors, while it occurred among 5.7% of students. A total of 10.9% of students expressed their disagreement with the idea that their training, through online courses, corresponds to the trend of intensifying technology and adapting to the professions of the future. These students may be reluctant to this trend or are not aware of it, or the profile of the profession to which they have oriented does not really impose it. However, more than half of the responding students, i.e., 55.5%, show a total agreement (16.7%) or agreement (38.8%) with the idea that the training acquired through online courses is appropriate to the future trades and technologies that will appear. Almost half of the responding professors (49.7%) appreciate that online education can contribute to students' individual development, with 12.7% indicating the options "to a very high extent" and 37% "to a high extent". On the other hand, 13.9% of university professors believe that online education can contribute to the individual development of the students only to a small or very small extent. In this respect, students' vision is not very different, but the percentages are different. Thus, 34.9% of students, compared to 49.7% of professors, answered that online education contributes to their individual development. For other students, online education would contribute to their future development only to a low extent (16.7%) or even to a very low extent (10.5%) (Figure 11).

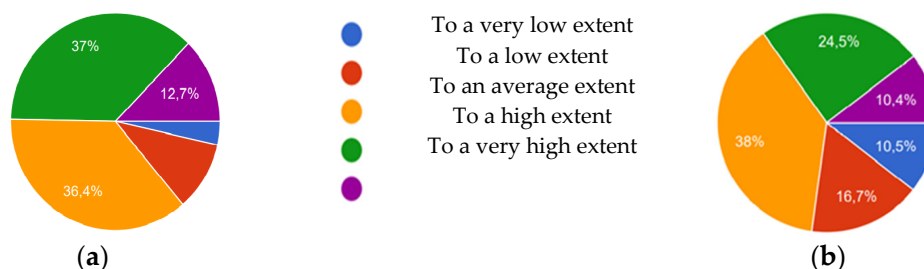**Figure 11.** Degree to which online education can contribute to students' individual development ((**a**) professors, (**b**) students). Source: own research.

Online education is considered a factor in the development of society as a whole by 51.4% of professors. Thus, 15% of professors agree with this idea to a very high extent, and 36.4% to a high extent. In other words, 4% of professors consider this possible only to a very

low extent and 14.5% to a low extent. This percentage is much lower than that forwarded by students, who are much more skeptical about the possibility of online education being a real factor in the development of society. A total of 31.4% of students consider that online education can be a factor in the development of society. Only 32.4% of students, compared to 51.4% professors, consider online education as a factor playing a role in the future development of society (Figure 12).
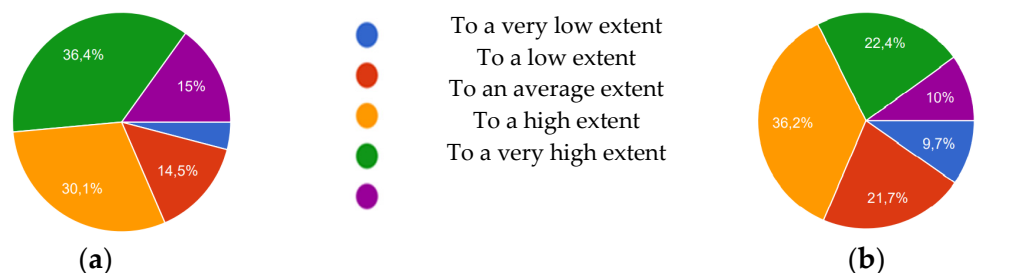

Figure 12. Degree to which online education can be a factor in the development of society as a whole ((**a**) professors, (**b**) students). Source: own research.

Professors, in a proportion of 60.7%, believe that the digitalization of education will contribute to the development of individuals and society and, implicitly, to the increase of economic competitiveness. Out of the total number of responding professors, only 16.2% consider that the digitalization of education could not be a factor of individual and social development, leading to increased economic competitiveness in the future. However, 48.2% of students say that the digitalization of education can contribute to the development of the individual and society and, implicitly, to the increase of economic competitiveness (Figure 13).
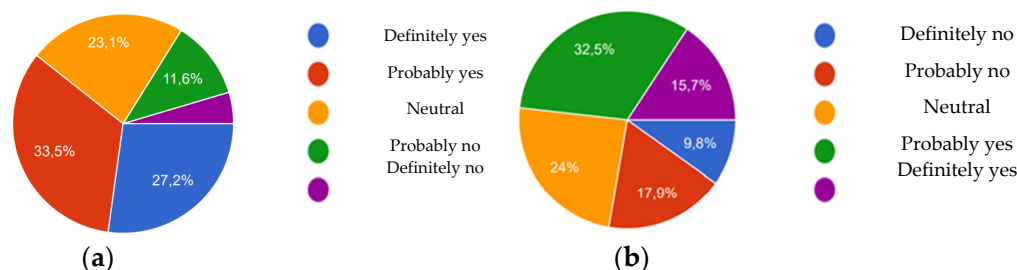

Figure 13. The extent to which the digitalization of education will contribute to the enhancement of economic competitiveness ((**a**) professors, (**b**) students). Source: own research.

Scientific research is just as important as the teaching activity for professors. That is why, in a proportion of 15%, the professors declare that during the online courses, the results of their research activity reached an even higher level. For 56.1%, they remained at approximately the same level, and for 28.9% of them, the research activity decreased to a lower level.

The period generated by the pandemic created the possibility for education to take place in forms other than the traditional one. For professors, regardless of the form of education, the results must be maximum. This idea is demonstrated by the 54.9% percentage that professors give to the hybrid form of education, which is considered to be the one that can provide the best results for education. There are a number of professors who believe that traditional education could generate better results (37.6%), and, on the other hand, 7.5% of them give more credit to online education. In the case of students, the form of education that suits them best is the hybrid one, which is indicated by 38.5% of them (Figure 14). The traditional form of education is appreciated by 36.5% of students, and the online form of education is considered to be the most appropriate by 25% of them. However, it should be

noted that students indicate the appropriate form of education depending on flexibility, free time, or the job in which they are involved, not necessarily on the results they will achieve.
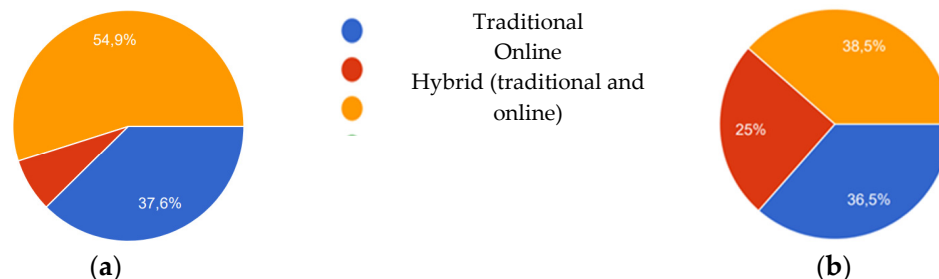

Figure 14. Forms of education that can generate better results ((**a**) professors, (**b**) students). Source: own research.

When social distancing restrictions come to an end, the teaching activity can be transferred on site. In this context, it becomes a challenge for both professors and students to determine how teaching activities should take place. Thus, 54.9% of professors believe that teaching activities should be conducted in a hybrid form after the pandemic period, 37% prefer the traditional version, and 8.1% prefer online education. On the other hand, 40.4% of students believe that, after the pandemic, teaching and learning activities should be carried out in a hybrid way; 39.5% support traditional education and 20.1% believe that online education should be continued.

As regards the analysis of the level of representativeness of the sample of respondents, as well as of the answers provided by them, we further drew up a centralization of the results of the calculations performed for the criteria explained above. Each initially set objective corresponds to at least one of these criteria, and in the case of OS1, OS3, OS5, OS6, and OS7, it is possible to verify the degree of homogeneity by calculating statistical indicators: the weighted arithmetic mean, dispersion, quadratic mean deviation, and coefficient of variation (Table 3).

The table above shows that, both in the case of the answers given by the students and in the case of the professors' answers, the values calculated for the coefficient of variation fall, in most cases, in the range of 0–35%, indicating a low spread of the answers and a high degree of homogeneity and representativeness, respectively. However, there are also criteria in which the level of homogeneity is relative, the answers being influenced by personal or perceptual factors, with the values falling within the limit 35–50%. Such situations are represented in the case of professors by the issue of the level at which the assessment reflects the skills acquired and the extent to which online education offers greater opportunities than traditional education to assimilate knowledge and develop skills. In the case of students, we can identify several cases of relative homogeneity, regarding, namely: the ease of understanding the notions transmitted; the level of participation and involvement of students in online activities; correspondence between the volume of acquired knowledge and the knowledge necessary for the profession; the contribution of online education to the development of the individual; the perspective of education as a factor in the development of society; the extent to which online education offers greater opportunities than traditional education to assimilate knowledge and develop skills.

Table 3. Statistical verification of results. Source: own research.

Variable	Corresponding Objective	Category	N	Weighted Arithmetic Mean	Dispersion	Standard Deviation	Variation coEfficient
The level of adaptation to online education	OS 1	Professors	173	4.19	0.675	0.821	19.6%
		Students	732	3.69	1.184	1.088	29.505%
General framework for conducting online activities	OS 3						
Items	OS 3	Professors	173	4.38	0.674	0.821	18.76%
Quality of information transmitted		Students	732	3.64	1.288	1.135	31.184%
Volume of information transmitted		Professors	173	4.34	0.689	0.830	19.095%
		Students	732	3.66	1.384	1.176	32.166%
Access to learning resources		Professors	173	4.42	0.671	0.819	18,545%
		Students	732	3.76	1.386	1.178	31.312%
Ease of understanding notions		Professors	173	3.88	0.807	0.899	23.133%
		Students	732	3.37	1.569	1.253	37.180%
Professors' involvement		Professors	173	4.16	0.806	0.898	21.574%
		Students	732	3.83	1.302	1.141	29.818%
Professors' receptivity		Professors	173	4.14	0.910	0.954	23.014%
		Students	732	3.64	1.429	1.196	32.842%
Students' online participation level		Professors	173	3.76	0.898	0.947	25,177%
		Students	732	3.19	1.522	1.234	38.632%
Students' involvement level		Professors	173	3.43	1.112	1.055	30.721%
		Students	732	3.12	1.543	1.242	39.762%
The assessment reflects the level of skills acquired	OS 3	Professors	173	2.85	1.099	1.048	36.784%
		Students	732	-	-	-	-
Correspondence between the knowledge volume acquired—knowledge necessary for the profession	OS 5	Professors	173	3.46	0.745	0.863	24.974%
		Students	732	2.98	1.358	1.165	39.053%
Usefulness of acquired digital skills	OS 5	Professors	173	3.94	0.575	0.758	19.23%
		Students	732	3.34	1.209	1.099	32.883%
Correspondence between students' individual training and level of technology intensification	OS 6	Professors	173	3.82	0.706	0.840	21.925%
		Students	732	3.50	1.146	1.071	30.612%
Contribution of online education to individuals' development	OS 6	Professors	173	3.45	0.918	0.958	27.766%
		Students	732	3.07	1.242	1.114	36.235%
Education—factor in the development of society	OS 6	Professors	173	3.44	1.079	1.039	30.198%
		Students	732	3.01	1.228	1.108	36.787%
Relationship between education digitalization and increasing competitiveness	OS 6	Professors	173	3.67	1.273	1.128	30.738%
		Students	732	3.26	1.456	1.207	36.978%
The extent to which online education offers greater opportunities than traditional education to assimilate knowledge and to develop skills	OS 7	Professors	173	2.80	1.094	1.046	37.315%
		Students	732	2.69	1.415	1.189	44.148%

Of course, speaking of a relative level of representativeness and determinants, we can see that these criteria listed above are interconditioned, so the level of participation and involvement of students in online activities can decisively influence and ease of understanding the notions transmitted and the perception regarding the contribution of online education to individual development, respectively.

5. Discussions

In this part of the paper, we will analyze the extent to which the results of our research are supported or contradicted by studies on the same topic or that address related topics.

In relation to the proposed research questions, regarding RQ1 (*Is the process of adapting to the online teaching system difficult and does it require strong national support?*) and the subordinate objectives (OS1), we find that the topic of the impact of the COVID-19 pandemic on various areas of life has been intensively analyzed in the literature. According to Nepal and Rogerson (2020), the COVID-19 pandemic accelerates the development of online education, leading to a paradigm shift [64] in terms of the teaching–learning process. After almost two years in which, in most universities, online education has become dominant,

the question arises as to whether the current educational landscape is or should become "the new normal" [65].

It is difficult to say which of the two forms of learning generates better results; each of them has both positive and negative aspects, as they have been identified in terms of the advantages and disadvantages selected by respondents in the study applied. To place online education too categorically into either of the two categories would be a reckless step, as its level of effectiveness depends on a set of factors that can be translated into different situations, depending on the general framework in which the act of teaching–learning-assessment takes place, becoming pillars of a solid construction or, on the contrary, destabilizing elements of this system.

This study also highlighted difficulties of adapting to online education both for students and for professors, this idea being found in other research works [66,67], which also emphasizes the need to accept change, which is a constant and inevitable route towards progress and development.

In order to make the transition to online education easier, governments and universities need to offer professional development programs for the effective use of educational platforms, given the difficulties faced by participants in the online education process [67,68]. It would also be important for educational institutions to provide beneficiaries of the educational process with programs that help them become familiar with new ways of working in the online environment [69].

Beyond the obvious disadvantages of online education, it offers flexibility if we consider time and space issues [70]. Thus, in order to answer question RQ2 (*Is online education more attractive and flexible? Are the results obtained questionable, in the absence of a coherent strategy?*) and to respond to OS2 and OS3, we identify arguments both in the results of our own research and in the literature [68]. The internet is a widely used research and education tool, especially in recent times, as it offers to the interested parties, very quickly, global information, no matter where the beneficiaries of this information are (at home, at the office, or on a trip), and online learning offers, from this point of view, greater flexibility [71].

The major disadvantages of online education are the difficulty of maintaining the attention of students, along with the instability of the internet connection [65], student motivation, poor interaction and, above all, fairness of the assessment [70], ideas also reflected in this paper.

In the context of e-learning, perhaps the most delicate issue is the ability to monitor online tests; professors, beyond some facilities offered by online platforms (e.g., the focus mode function on Zoom), lack adequate control over the possibilities of students to access various sources of information for documentation during exams [72].

Online education requires much more effort, both physical and intellectual, and even mental health problems develop over time [66,73], with the Coronavirus pandemic generally having a negative effect on public health [74].

The world is undergoing a profound process of change, determined, on the one hand, by the complex phenomenon of digitization, which triggers paradigm shifts in multiple areas of life. On the other hand, there is more and more discussion about "a new normal", which will generate a recalibration of most areas, including education. The Coronavirus pandemic was just a series of unfortunate events, which generated an unwanted and unexpected impetus meant to increase the level of adaptability and flexibility of the educational process. In the process of digitization, however, we could consider that the pandemic did nothing but accentuate an inevitable phenomenon, which, in time, aimed at a natural transition to online. Under the shock of the moment, however, the transition was more or less easy, a major role in this regard being played by a conglomeration of factors, among which we find both the level of digital skills of technology users, motivation, openness to learning, interest in the use of new educational platforms, and so on and so forth. However, as the future seems to belong to the digital, online tools will continue to be maintained, at least as a support for learning, even if there is no complete transition to the online environment. So, in response to question RQ3 (*Will online tools continue to*

be increasingly integrated into the teaching process, even after the end of the pandemic?) and RQ4 (*Are individual skills and performance, acquired through online education, dependent on the existence of appropriate devices and individuals' ability to use them?*), and also considering the subordinated objectives OS6, OS7, and OS5, the results of our study support these ideas: most of the professors who answered the questionnaire, and most of the students who indicated that online education contributes to some extent to their individual development, thereby justifying its usefulness and becoming an important trigger of the development of society as a whole and of education digitalization, while contributing to the enhancement of economic competitiveness, also provided that online platforms are constantly improved and adapted to the specifics of different fields and curricula. Another condition that must also be met is the increasing of the individual motivation of students and professors alike, in order to assimilate and transmit, respectively, the knowledge necessary for increasing the quality of the human factor, as a pillar of society's development.

Beyond these questions proposed at the beginning of the research, determined on the answer given to the questions in the questionnaire, but also following some direct observations, we propose a new additional question, which can also materialize in a new direction of research, namely—What are the real ethical dimensions of the online teaching–learning-assessment process? Are the results obtained by the students during this whole period fair? Do they realistically reflect the level of knowledge acquired, given that the phenomenon itself is not fully controllable?

In the context in which students cannot be monitored with the same accuracy when taking exams at home, compared to those taken physically, the hybrid school system is the one proposed as the most effective by most professors who answered the questionnaire. Surprisingly, this option is also accepted by students, who, beyond the advantages offered by the online environment, are eager to return at least partially to the way they conducted teaching–learning activities in pre-pandemic times.

Obviously, online education has required compromise, combining the old with the new, offering both advantages and disadvantages. However, it remains a work-in-progress, with much room for improvement in the future.

6. Conclusions

Numerous research reports and studies in the literature show that education is, without a doubt, one of the most important factors that contribute to the enhancement of economic competitiveness and, in general, to the development of society. The big challenge, in the current context, however, is to identify the best answers to the question "to what extent can online education also be a pillar for the increasing of competitiveness?" The pandemic generated by the presence of the SARS-CoV-2 virus put pressure not only on the medical and social protection systems, but also on the education system—and on the economy as a whole.

Differences of opinion regarding teaching–learning-assessment methods seem to have become more and more poignant lately, especially in the context in which, in most countries of the world, education has been transferred, at least for a time, exclusively to the online environment. Answering "yes" or "no" to such a complex issue would involve a far too simplistic approach, with undesirable consequences not only on the learning outcomes of certain generations of students, but on the future of nations. Technology takes on new dimensions from one year to the next and maybe even faster, which means society must adapt rapidly to new challenges, and the education system cannot stay out of the "game". It is becoming a necessity for the educational field to use more and more learning platforms that connect people concerned with a certain subject, even if they are in different corners of an area, a country, or the world.

Surprisingly, professors have adapted more easily to online education than students, but the explanation may be that, for the former, it was a "job task". On the other hand, although the degree of demand in the online environment was, for most professors, much higher than in the traditional system, the degree of attractiveness of these activities was,

for most students, slightly lower than in the case of activities carried out in the classroom, with all the concerns of professors to capture attention and create a constructive dialogue with the beneficiaries of educational services and to encourage interaction, innovation, and creativity. Both professors and students believe that the main advantages of the online system are flexibility, i.e., participation from anywhere in teaching and learning activities, developing skills to use various platforms and devices, access to many information resources, and even the encouragement of creativity and innovation. Moreover, in terms of the disadvantages of online education, there is consensus between the providers and beneficiaries of educational services: the most invoked negative aspects of online education are the great amount of time spent in front of a device (phone, tablet, laptop, PC), the difficulty of maintaining motivation among students, the low relevance of the evaluation, the creation of an impersonal educational climate, as well as the very high demand that the online activity implies.

Therefore, in addition to the benefits of online education, the focus of decision makers both at national and institutional levels should be laid on identifying barriers to the use of information and communication technologies, which should be removed in order to make digital education more sustainable. When each student has a quality device, when the internet allows a smooth connection, when educational platforms become more friendly for both students and professors, when the latter can benefit from more training courses on the use of platforms, and when student motivation becomes higher and online assessment can be made more objective, the chances of increasing the education system's performance shall be enhanced.

On the other hand, it is considered that the various digital skills acquired during this period by students will be useful to them in their professional activity, being in line with the trend of intensifying technology and adapting to the professions of the future. Maybe that is why most professors and most students believe that online education can contribute to the development of the individual and society and, thus, increase economic competitiveness, also believing that the form of education that could generate the best results is hybrid, a variant that combines the advantages of traditional education with the advantages of online education.

Thus, considering all the above, we think that investments in technology and the digitalization of education, in general, represent together not only "a fashionable item", but also an absolute necessity for the proper training of current generations of pupils and students and, implicitly, for increasing economic competitiveness. However, all these investments in technology cannot and must not replace traditional education; they should complement it, support it, and complete it, because educational services, such as medical services, are characterized, among other things, by the inseparability of the provider from the beneficiary, and the creation of a motivating learning climate, with "tangible", personal elements that can contribute with great success to the development of the individual and of society.

Appendix A

Table A1. Research design.

Research Question	Variable			Corresponding Objective	Questions Questionnaire 1—Professors	Questions Questionnaire 2—Students
RQ1. Is the process of adapting to the online teaching system difficult, and does it require strong national support?	The level of adaptation to online education.			OS1. Identifying the level of adaptation to the specifics of online education.	Q1—To what extent have you adapted to online education?	Q1—To what extent have you adapted to online education?
					Q2—What type of device do you use to connect to teaching activities?	Q2—What type of device do you use to connect to learning activities?
RQ2. Is online education more attractive and flexible? Are the results obtained questionable, in the absence of a coherent strategy?	The degree of demand and attractiveness of online teaching activities.			OS2. Identifying the degree of demand and attractiveness of online teaching activities.	Q3—How do you rate the online activity, compared to the classroom activity, in terms of the degree of demand of the professor? (less demanding/ just as demanding)	Not applicable.
					Q4—How do you rate the online activity compared to the classroom activity, in terms of the degree of attractiveness for students? (less attractive/just as attractive/ more attractive)	Q3—Do you consider that online activity is generally: (more demanding than class activity/ less demanding/ more attractive/boring/ just as demanding and attractive)?
					Q6—During my online activities, my main concern is: (for students to take notes on the basics/to create a constructive dialogue/to ensure as many people participate as possible).	Q4—During online activities:- You pay attention and write down the ideas that you consider important;- You pay attention, but you are not used to writing down anything;- You used to do other activities.
	General framework for conducting online activities.			OS3. Identifying the positive and negative aspects of online education.	Q7—Appreciate, on a scale from 1 to 5, where 1 means "total disagreement", and 5 means "total agreement", the following statements regarding online education:	Q5—Appreciate, on a scale from 1 to 5, where 1 means "total disagreement" and 5 means "total agreement", the following statements regarding online education:
	Items	Quality of information transmitted.			The quality of the information transmitted was in line with the objectives of the discipline.	The quality of the information provided was adequate.
		Volume of information transmitted.			The volume of information transmitted was appropriate to the specifics of the subjects.	The volume of information transmitted was appropriate to the specifics of the subjects.
		Access to learning resources.			Students' access to learning resources was easy.	Students' access to learning resources was easy.
		Ease of understanding notions.			The feedback from the students showed that the notions transmitted online could be easily understood.	The information transmitted online could be easily understood.
		Professors' involvement.			The involvement of professors in conducting online activities has generally been high.	The involvement of professors in conducting online activities has been high.
		Professors' receptivity.			Professors' receptivity to student issues has generally been high.	Professors' receptivity to student issues was high.
		Students' online participation level.			Student participation in online teaching activities has been high.	Student participation in online teaching activities has been high.
		Students' involvement level.			Implicarea studenților în desfășurarea activităților online a fost ridicată.	The involvement of students in conducting online activities has been high.
	Other general framework.				Q5—The time dedicated to the documentation and elaboration of the didactic materials, adapted for the online environment, compared to the activity in the classroom/seminar/laboratory, it was generally: (lower/approximately the same/higher).	Not applicable.

Table A1. *Cont.*

Research Question	Variable	Corresponding Objective	Questions Questionnaire 1—Professors	Questions Questionnaire 2—Students
	Positive aspects of online education.		Q11—What do you think are the positive aspects of online education? (Flexibility, the pleasure of using technology, encouraging creativity and innovation, faster feedback, etc.)	Q8—What do you think are the positive aspects of online education? (Flexibility, enjoyment of technology, encouragement of creativity and innovation, faster feedback, etc.)
	Negative aspects of online education.		Q12—What do you think are the negative aspects of online education? (Demanding activity, time management difficulty, quality of internet connection, impersonal character, etc.)	Q9–What do you think are the negative aspects of online education? (Demanding activity, time management difficulty, quality of internet connection, impersonal character, etc.)
	The assessment reflects the level of skills acquired.		Q9—To what extent do you consider that the online assessment reflects the level of skills acquired by students?	Not applicable.
	The level of involvement in extracurricular and research activities, in the context of online education.	OS4. Identifying professors' level of involvement in extracurricular and research activities, in the context of online education.	Q20—In the context of online education, have you conducted extracurricular activities with students?	Not applicable.
			Q21—Compared to the pre-pandemic period, during the course of the online courses, the results of your research activity were: at a lower level/approximately at the same level/at a higher level.	Not applicable.
RQ4. Are individual skills and performance, acquired through online education, dependent on the existence of appropriate devices and individuals' ability to use them?	Correspondence between the knowledge volume acquired—knowledge necessary for the profession.	OS5. Identifying the level of skills acquired through online education.	Q13—To what extent do you consider that the amount of knowledge gained online by your students is sufficient/appropriate for the profession for which they are preparing?	Q10–To what extent do you consider the amount of knowledge you have acquired online to be sufficient/appropriate for the profession in which you are trained?
	Usefulness of acquired digital skills.		Q14—To what extent do you agree that the various digital skills acquired during this period are useful acquisitions for your teaching and research activity?	Q11–To what extent do you agree that the various digital skills acquired during this period are useful acquisitions for your educational activity?
			Q15—To what extent do you agree that the various digital skills acquired during this period by your students will be useful in their professional activity?	
RQ3. Will online tools continue to be increasingly integrated into the teaching process, even after the end of the pandemic?	Correspondence between students' individual training and level of technology intensification.	OS6. Assessing the perspectives of online education, starting from the current context.	Q16—Do you agree that the level of preparation of students, acquired through online courses, corresponds to the trend of intensification of technology and adaptation to the professions of the future?	Q12–Do you agree that your preparation for online courses is in line with the trend of intensifying technology and adapting to the trades of the future?
	Contribution of online education to individuals' development.		Q17—To what extent do you think that online education can contribute to the individual development of the student?	Q13–To what extent do you think that online education can contribute to the development of the individual?
	Education—factor in the development of society.		Q18—To what extent do you think that online education can be a factor in the development of society as a whole?	Q14–To what extent do you think that online education can be a factor in the development of society as a whole?
	Relationship between education digitalization and increasing competitiveness.		Q19—Do you think that the digitalization of education can contribute to the development of the individual and of society and, implicitly, to the increase of economic competitiveness?	Q15–Do you think that the digitalization of education can contribute to the development of the individual and of society and, implicitly, to the increase of economic competitiveness?

Table A1. *Cont.*

Research Question	Variable	Corresponding Objective	Questions Questionnaire 1—Professors	Questions Questionnaire 2—Students
	The extent to which online education offers greater opportunities than traditional education to assimilate knowledge and to develop skills.	OS7. Studying the perception of online education vs. traditional education.	Q8—To what extent do you think that online education offers more opportunities than traditional education to assimilate knowledge and develop skills?	Q6–To what extent do you think that online education offers more opportunities than traditional education to assimilate knowledge and develop skills?
			Q10—Would you access online training programs?	Q7–Would you access online training programs?
			Not applicable.	Q16—Your level of involvement in the online environment, compared to the activity in the classroom/seminar/laboratory is generally: lower/approximately the same/higher.
			Q22—Which forms of education do you think can lead to better results? (Traditional/online/hybrid.)	Q18—Which form of education do you think is best for you? (Traditional/online/hybrid).
			Q23—Do you consider that in the future (after the pandemic period), teaching activities should take place: (traditional/online/hybrid)?	Q19—Do you consider that in the future (after the pandemic period), teaching activities should take place: (traditional/online/hybrid)?

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