Article

Instructional Framework for Emergency Remote Teaching in Higher Education

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Abstract: The COVID-19 crisis has considerably changed the educational landscape and resulted in a scientific debate on the efficacy and prospects of online education. Recent research is focused on analyzing the psychological and instructional difficulties faced by both educators and learners during emergency remote teaching (ERT). However, a limited number of studies tends to present a holistic instructional framework that could benefit educators in situations of a similar educational crisis. This study aims at identifying psychological and pedagogical implications for instructional framework design in situations of abrupt transition to online learning. Employing a qualitative approach, this study is based on the dataset collected from 152 students obtaining bachelor's and master's degrees in social sciences. This dataset was analyzed and interpreted by means of descriptive statistics. The findings helped to identify students' perceptions of ERT, core difficulties, and preferences which underlay the conceptualization of the instructional framework adjustable for ERT. The presented instructional considerations could contribute to the effective design of technology-assisted courses in the context of higher education.

1. Introduction

The COVID-19 outbreak significantly modified the educational and social environment around the globe. It appeared to be a litmus test for the viability of educational systems and instructional frameworks as well as for learners' and educators' adaptability to uncontrollable and unpredictable changes. During the pandemic, traditional instructional frameworks were substituted by emergency remote teaching (ERT), which posed a challenge for both educators and learners [1–3]. Recent research on ERT reveals that faculties and students encountered problems adhered not only to adjusting teaching and learning strategies, but also to their social and emotional well-being [4,5]. Researchers report that educators lacked ICT knowledge, did not receive enough guidance and support from the administrative board, as well as being emotionally unprepared to conduct all classes online [6,7]. Additionally, due to an abrupt change in the instructional mode, educators experienced an increase in workload, which reportedly affected the quality of the instruction that was hastily adjusted to the digital learning environment.

The studies also highlight the difficulties encountered by learners during emergency remote teaching and learning, such as a lack of access to technological devices, an absence of previous experience in online learning, and an inability to control their learning pace. It is also suggested that social distancing had a negative impact on students' mental state, and their abilities to identify and regulate emotions. Additionally, it is reported that ERT affected the quality of education and well established norms of digital interaction [8–11].

Although the COVID-19 crisis completely transformed educational landscapes, it brought about new instructional practices and a new vision for the role of contemporary

online education [12,13]. This promotes further research on instructional frameworks for online learning and ERT, which should be primarily based on pedagogical theories and psychology of learning and requires critical analysis and reflections on ongoing changes in educational systems, educational policies, and digital learning as a global approach to designing effective instructional systems of equal opportunities for all learners. This paper aims at identifying and conceptualizing the psychological and pedagogical implications for the effective design of the ERT instructional framework in higher education. It seeks to answer several questions:

Q1: What psychological and instructional difficulties did students experience during ERT?
Q2: What educational theories should underpin the ERT instruction as a type of online learning?
Q3: What instructional framework could possibly be used to satisfy the educational needs of learners within ERT and ensure a smooth transition to online mode in case of emergency?

The present study chooses to focus on students' perceptions of ERT in higher education, as in learner-centered pedagogies, students, as main social agents, are placed at the center of the teaching–learning process. The study examines the pedagogical and psychological domains of the learning process, which lay the basis for varied instructional frameworks design. It reveals learners' attitudes, behaviors, and opinions about ERT and highlights the ways of improving the instructional frameworks to make them adjustable in situations of emergency remote teaching.

1.1. The Pedagogical Stance on ERT as a Type of Online Learning

The rapid spread of the new coronavirus led to the immediate closure of educational institutions all over the world and the introduction of "new norms" of social and educational behaviors. Universities, colleges, and schools attempted to briskly digitalize existing instructional content, the forms of its delivery, and ways of collaborating with students. This urgency in the switch of the teaching mode and learning modality set the stage for conceptual discussion of new educational phenomena—"emergency remote teaching" and "pandemic pedagogy". The concept of emergency remote teaching (ERT) is now used to describe the process of online learning temporarily adopted in response to a crisis situation, where no other learning modalities are feasible [14,15]. Researchers argue that this specific term should be used to address the differences between an enforced decision to shift to online learning and thoughtful and careful design of online instructional systems. This heated debate resulted in the necessity to rethink the ways of online instructional strategies design and define a clear boundary between online and "quasi- online" education. This also promotes the conceptual design of an instructional framework, serving as a universal and adaptable solution for an effective transition to online education in situations of social uncertainty.

Indeed, the concept of online education has a long-standing history. A great number of studies focus on models of online education, syllabus design, assessment standards and evaluation criteria, instructional strategies, and materials development [16–18]. In this regard, an effective online course requires careful planning of instructional content, thorough design of tasks, learning activities, and collaboration of learners assisted by media and technologies. Additionally, the ultimate goal of online learning is to create a digital learning environment where learners are able to construct their own knowledge and gain target skills while acquiring valuable context-bound experiences. The high-quality online instruction is aligned with desired learning goals and relies on pedagogical theories; the critical considerations which govern each step and area of instructional design.

Recent research suggests that the design of instructional systems within online education mostly derives from cognitivism, objectivism, and social constructivism as major educational theories [19,20]. The ideas of cognitivism are reflected, for instance, in information processing learning theory which attempts to describe and explain changes in the mental processes, strategies that lead to the cognitive development of learners, as well

as how students acquire, encode, store, and retrieve information, how they form their learning styles with respect to their personalities and propensities. The theory of social constructivism considers teaching and learning as a complex interactive social phenomenon occurring between teachers and students. It was posited that learning is based on problem solving, so the social construction of solutions to problems underlies the learning process. The core ideas of social constructivism were reflected in subsequent theories, for instance, in the theory of Wenger and Lave who promoted the concepts of "community of practice" and "situated learning" [21]. These ideas manifest themselves in theories for online education, such as community of inquiry (CoI), connectivism, online collaborative learning (OCL), and online education theory [22–24]. These theories are developed to describe the essence of online education, its collaborative context, pedagogical principles, and instructional models.

Online instruction modelling is supported by pedagogical principles, defined as fundamental prepositions about teaching methods and learning practices [25]. These principles create a solid foundation for the effective use of teaching strategies, the design of learning materials, and the careful choice of communication and collaboration modes. Summarizing varied theoretical assumptions, online instruction design should be governed by the following considerations: (1) address individual differences and preferences; (2) evoke learners' motivation; (3) avoid cognitive and information overload; (4) stimulate social interaction among learners; (5) design real-life contexts; (6) provide practical application; (7) encourage learner reflection; (8) ensure online classroom dynamics and motion; (9) create an accessible learning environment; and (10) arrange regular feedback and assessment.

Individual differences and preferences in terms of learning engagement among students can be identified in their attitudes, level of mastery, abilities to transfer skills and knowledge, and speed of information processing. Additionally, the learners might prefer different ways of content presentation and different ways of dealing with it. These learners' abilities and preferences eventually affect the learning outcomes. This means that it is critically important to identify these differences and recognize them while designing an online instruction. It can be carried out by considering multiple formats of content delivery (animation, charts, presentations, webinars, etc.), allowing an individual pace of learning, encouraging collaborative work and peer teaching, and assessment.

It has been widely discussed that learners' motivation is at the heart of effective educational process [26,27]. Learners' motivation is tied to several aspects such as academic expectations, the level of satisfaction with the learning experience, the complexity and relevance of instructional content, and confidence in one's own learning abilities. From a teaching perspective, this stipulates the design of a learning environment that enhances and fosters learners' interest, confidence, and emotional engagement by introducing varied game-based teaching techniques, simulations, meaning-driven discussions, and problem-oriented activities. Additionally, these activities support the attention span and help learners avoid cognitive and information overload. For these purposes, it is necessary to create a "balanced blend" of activities that "chunk" instructional content and are supported by visuals or animation.

The educational process, whether online or in-class, is based on the interaction between all participants. Educational interaction involves communication between instructor and learners as well as between learners and learners, which might be modelled by different communication technologies (forums, emails, chats, social media, etc.) [28,29]. Since the sense of belonging to a "knowledge community" is proved to be enriching for learners, online interaction should provide learners with opportunities to establish connections with educators and other learners within the learning environment. From a pedagogical stance, this assumes the design of synchronized online tutorials, mentoring or coaching sessions, and interactive lectures. Learners should be placed in the online social community, where, by interacting with others, they are able to construct their knowledge and polish their communication skills.

Educational interaction—interaction organized for teaching and learning purposes—should be inscribed in real-life contexts. The relation to real-world situations is a driving force for further practical application of gained knowledge and skills. Real-world situations allow learners to transfer theoretical knowledge into practice, connect new information with existing knowledge, and elaborate on potential problems and their solutions. Additionally, introducing learners to real-life situations encourages their active involvement and, from a teaching perspective, stimulates the use of active learning strategies (problem-solving activities, case-based learning, project-based learning, etc.). Active learning strategies also support classroom dynamics [30]. They help create an interactive classroom where learners are engaged in collaborative and individual work during synchronized online sessions. Classroom dynamics are particularly important in online teaching and learning as the attention span of online learners is reported to be shorter than during face-to-face educational interaction [31,32]. This means that the online learning process should be well-supported by a balanced mix of team, paired, and individual work, discussion sessions, questioning, and animated (in motion) visuals that help learners stay focused.

The learning process is an iterative process of revising, interpreting, and reconceptualizing meanings that guide learners in their actions. This process is based on reflection. Reflection in classrooms allows learners to look back at their experiences and align them with practice, construct new knowledge, and identify the ways of personal improvement [33]. The development of reflective skills in learners is ensured by timely assessment and ongoing feedback. Within online education, planned assessment and detailed feedback become crucially important due to the lack of real communication, and the opportunities to give 'spontaneous' feedback by means of verbal and non-verbal communication.

The accessibility of online education is another crucial factor in delivering digital training. All the content developed by educators and the technologies used to support the learning process must be accessible to all learners. Additionally, these technologies and content should be adjustable to meet the special educational needs of some learners.

The course design within ERT, as a type of online learning, should be governed by similar principles. However, it has been pointed out that some of these principles were partly followed or even ignored [1–5]. This influenced the quality of courses delivered within ERT and, to a certain extent, strengthened the myth that online learning is less effective than traditional in-class training. In this regard, the quality of online education (ERT or not) depends on the abilities of educators to develop an instructional framework that meets the learning objectives and fits in with the educational context.

1.2. The Psychological Stance on ERT as a Type of Online Learning

Apart from the pedagogical underpinnings of ERT, current studies focus on the psychological aspects of online learning during the COVID-19 crisis. A growing body of literature primarily focuses on the reasons that underlie psychological imbalance among students during ERT [9,34–37]. Researchers have analyzed the changes in organizational routines of students, such as the study load with ERT, study–life balance, learning behaviors, attitudes, and habits as well as the influence of the "new norm" on the emotional state of students.

Studies suggest that there is a strong correlation between an inappropriate learning environment and the academic achievements of students [38]. During ERT, students living on-campus experienced difficulties in arranging a quiet and isolated place for studies, as well as several problems with unstable Internet connection and the use of electronic devices for learning. Additionally, students had limited access to some technical equipment, such as printers and copy machines, that they had been accustomed to using before the pandemic. In general, the vast majority of students reported concerns regarding their organizational routines, which they had to adjust to the new learning environment [39]. This significantly increased the level of students' anxiety and impacted their overall satisfaction with studies as well as their assessment scores, which reportedly became lower.

The necessity to study remotely revealed the inability of some students to schedule their day and studies in order to meet the deadlines without any extra reminders or

support from the faculty [40]. Poor self-discipline skills and a lack of well-developed learning strategies resulted in an increased study load, which, in turn, provoked excessive anxiety among students and lowered their learning efficacy.

Another factor, supposedly triggering the emotional well-being of students, was attributed to social distancing measures established by universities. The absence of habitual face-to-face contact with fellow students evoked negative emotions such as anxiety and frustration [35,41]. It also caused the fear of missing out (FOMO) among young adults, which cultivated a state of anxiety and a thirst for social approval as a way of positive psychological reinforcement [42].

Additionally, the restrictions on physical presence at work affected the financial situation of students working part-time. This also generated concerns about the studies prospects, the opportunity to maintain work–life–study balance, and necessity to change career choices, which, in some cases, might have caused a persistent feeling of sadness and apathy [38,41].

The psychological state of students during ERT was also influenced by fatigue from videoconferencing and intensive synchronous online learning [43]. Researchers identified several types of fatigue, namely, physical, physiologic, mental, and eye fatigue. Physiologic fatigue is defined as an improper balance of lifestyle activities such as physical exercise, sleeping patterns, and diet. Physical fatigue is perceived as a temporarily halted muscle's ability to perform at an optimal level. Mental fatigue is associated with difficulties staying focused and paying attention, a decreasing level of motivation, and a lack of interest. Eye fatigue is defined by symptoms such as dry eyes, blurred vision, difficulties maintaining visual focus, and eye pain. The studies suggest that fatigue during online sessions was mostly felt physically and visually [43]. It has also been identified that during synchronous online classes, students are exposed to videoconferencing fatigue as a combination of all fatigue types. This fatigue might also escalate due to an increasing cognitive load during online encounters, which occurs as a result of limited possibilities to identify non-verbal clues while interacting with others.

Therefore, the designers of online courses should take psychological aspects of learning into consideration and preferably provide learners with opportunities to accommodate themselves to course content and instructional modes. However, in the situation of ERT, neither educators nor students had time to adapt to a rapidly changing learning environment, which resulted in a massive criticism of online education and digitalization as a global trend.

2. Materials and Methods

2.1. Context of the Study

The rapid spread of COVID-19 in 2020 sent millions of people into lockdown, which completely changed their habits and routines. In light of rising concern, the majority of universities around the world postponed or cancelled on-campus studies and shifted to online or self-study learning modes. This urgent transition to online learning posed a challenge to faculties and institutions. A great number of educators were incapable of dealing with the existing technologies. Additionally, many universities did not have enough digital infrastructure or resources to facilitate online teaching and ensure a smooth transition to ERT. This rapid shift affected students as well. They experienced psychological tension and had to accept a complete change in their organizational routines.

In 2020, Peter the Great St. Petersburg Polytechnic University switched to online learning "overnight" after the government released a decree regarding the lockdown restrictions. Although our university possessed a well-developed digital infrastructure for online learning, educators were challenged to adapt their materials for online teaching as the majority of educational programs did not stipulate blended or online modes of training. The digital infrastructure and the overall level of ICT knowledge and skills allowed educators to cope with this challenge. However, it became obvious that the general approach to educational programs design required sufficient changes. At this time, the

faculty of our Graduate school decided to collect data that could help us rethink and reconceptualize the approaches to instructional design in situations of emergency transit to online learning.

2.2. Study Design

The conceptualization of an instructional framework that could be employed by educators to ease the transition to emergency remote teaching (ERT) relies on the analysis of students' ERT perceptions. For this reason, it was necessary to collect the data that could inform on difficulties experienced by students during ERT, their level of satisfaction with online studies, academic motivation and achievements, time spent on studies during ERT, organizational routines, their overall attitudes towards online instruction, etc. The analysis of these data would lay the basis for the reconceptualization of current instructional strategies and frameworks to make them fit in with the ERT context.

The study adopts the case study method as a research strategy. A case study is an empirical inquiry that enables a researcher to closely examine the data or real-life phenomenon within its original context. It allows researchers to utilize qualitative methods to obtain data and methods of descriptive statistics to present and visualize the collected dataset [42,43]. Case studies are designed to bring out the details from the viewpoint of the participants using multiple sources of data. It enables researchers to generate theories by observing actual practice in a certain context. This method lends itself "to early, exploratory investigations where variables are still unknown and the phenomenon is not at all understood" [44]. A common research framework stipulates the accomplishment of several steps: (1) to select a case; (2) to build a theoretical framework; (3) to collect the data; and (4) to describe and analyze the case.

This exploratory study considers ERT in higher education as a case that should be tackled from psychological and pedagogical standpoints. In terms of data collection and analysis, it would mean identifying two major domains and developing a set of descriptors that could help organize and describe the case. The analysis framework adopted in this study is presented below (Figure 1).
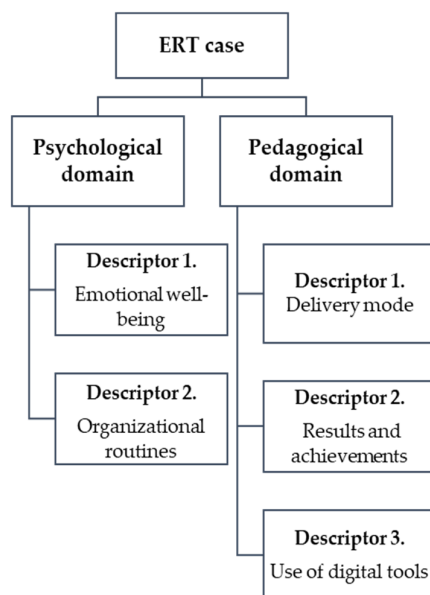

Figure 1. Holistic framework for ERT case analysis for higher education.

This framework enabled us to develop materials for data collection and laid the basis for its categorization, analysis and interpretation.

2.3. Data Collection and Materials

The data were collected by means of digital forums, online focus groups discussions, and a questionnaire. The focus groups included 7–10 participants (students), a moderator who was leading the discussion, and an assistant moderator who was taking notes and recording the session (according to university policy, all sessions with students had to be recorded). The discussions were semi-structured and covered issues related to: (1) pitfalls and benefits of online learning; (2) academic motivation and achievements; (3) emotional well-being; (4) suggestions for online learning improvement; and (5) pandemic and its influence on the social life of people. Since the number of focus group sessions was limited, we used digital forums to post the questions, encouraging students to comment on them.

Additionally, the developed framework and descriptors allowed us to design a questionnaire for collecting data on students' perceptions of ERT. It aimed at gathering information about students' attitudes, opinions, behaviors regarding their readiness for online learning, their level of satisfaction with ERT, changes in daily routines, and their opinions on technologies used during the ERT. The 35-item questionnaire was distributed online among students by means of entirely web-based systems. It consisted of three parts and included close-ended questions designed with a quantitative measurement scale (13 questions: e.g., Q: Choose the appropriate answer. The transfer to ERT turned out for me: 4—easy, 3—rather easy, 2—quite difficult, 1—very difficult), multiple choice questions with pre-determined answers (16 questions: e.g., Q: What is the most positive aspect of ERT?) and open-ended questions, which were designed as "checking questions" to support the questions with quantitative scale and multiple-choice questions (6 questions). While working with the questionnaire, students were supposed to choose a suggested answer, give an evaluative remark, or share their own ideas.

The developed questionnaire was analyzed in order to determine its internal consistency reliability and validity. The content validity of the questionnaire was assessed through expert judgments. The procedure included: (1) design of the tabulation forms based on 4-point Likert scale to evaluate the clarity and relevance of the developed questionnaire; (2) selection of a review panel—5 experts in the fields of pedagogy and psychology; (3) content validation; (4) revision of domains and items; (5) score calculation for each item; and (6) computation of the content validity indexes (S-CVI/UA, PR, S-CVI/Ave based on I-CVI). The review panel included four experts from four different Graduate Schools of our university and one expert from the partner university. The developed tabulation forms allowed experts to make qualitative observations on the accuracy of the language and the content of the questionnaire. The questionnaire was distributed by a digital survey platform together with the informed consent form, stating that any personal data and judgments would remain confidential. To compute the content validity indices we: (1) calculated scale-content validity index average based on item-validity index (S-CVI Ave based on I-CVI)—0.982; (2) proportion of relevance (PR)—0.986; and (3) scale-content validity index universal agreement average (S-CVI/UA)—0.914. The obtained indices allowed us to conclude that the designed questionnaire achieved an acceptable level of content validity, so it could be used for gathering the data. Subsequently, the instrument was pre-tested to assess its reliability among 30 participants who were not included in the indented sample. The internal consistency reliability was assessed for questions based on 4-point Likert scale by Alpha Cronbach and equaled 0.81.

The qualitative data from multiple choice questions and open-ended questions were processed using content analysis. The dataset was summarized for both groups of students, then categorized to comply with the suggested descriptors (themes), assessed for the frequency of predefined variables occurrence, and then interpreted. This allowed us to identify the main patterns in each respondents' group as well as the similarities and differences in relation to the descriptors. The quantitative data were analyzed by means of descriptive statistics: frequency distribution, central tendency.

The design and distribution of the questionnaire among students complied with the requirements of the University Ethics Commission. The ethical approval was received

from the Ethics Commission founded in the Institute of Humanities, Peter the Great St. Petersburg Polytechnic University (Approval Code: Protocol No 12. Approval Date: 24 March 2020). The results of the study were anonymized regarding any personal information or other references that could have identified an individual.

2.4. Participants

The study was conducted at Peter the Great St. Petersburg Polytechnic University in 2020 and involved 152 participants; bachelor's and master's students pursuing a degree in social sciences (Media and communication studies, Linguistics, Law, Pedagogy). The respondents' profile is presented below (Figure 2).
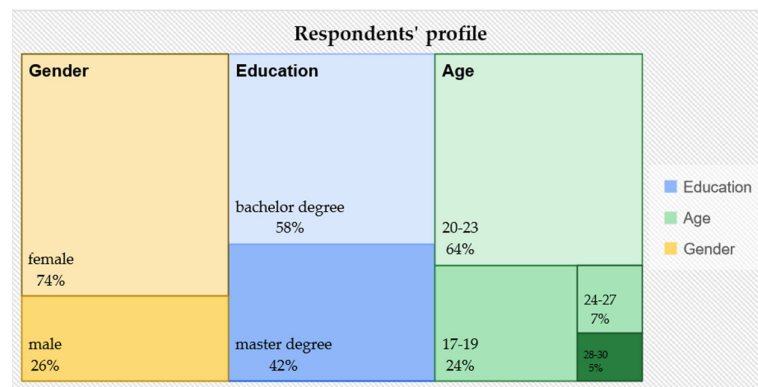

Figure 2. Respondents' profile.

To identify the study participants, a purposive sampling technique was used. It involves identifying and selecting individuals or groups of individuals that have specific knowledge or are experienced with a phenomenon of interest. Therefore, the choice of respondents was affected by several assumptions: (1) all respondents should have experience with ERT; (2) the participants should be master's or bachelor's students, as their educational programs include a lot of different courses; and (3) the sampling should not include foreign students as: (a) their educational programs are based on blended learning modes; (b) some cultural and language issues could have arisen. The major factor that affected the choice of sampling was the availability of respondents, their willingness and consent to participate in the study.

The vast majority of students possessed experience in online learning before ERT, namely, 90% among bachelor's students and 67% among master's degree takers (Figure 3).
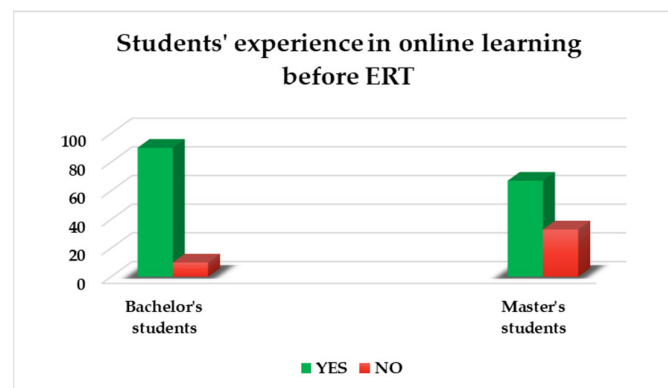

Figure 3. The ratio of bachelor's and master's students with prior online experience.

The following section presents the results of the questionnaire. Each domain is explored in detail in relation to the determined descriptors.

3. Results

Findings from the students' survey were organised to mirror the descriptors of the ERT case.

3.1. Pscychological Domain

3.1.1. Organizational Routines

The chart below represents the results obtained for master's and bachelor's students, accordingly (Figure 4).
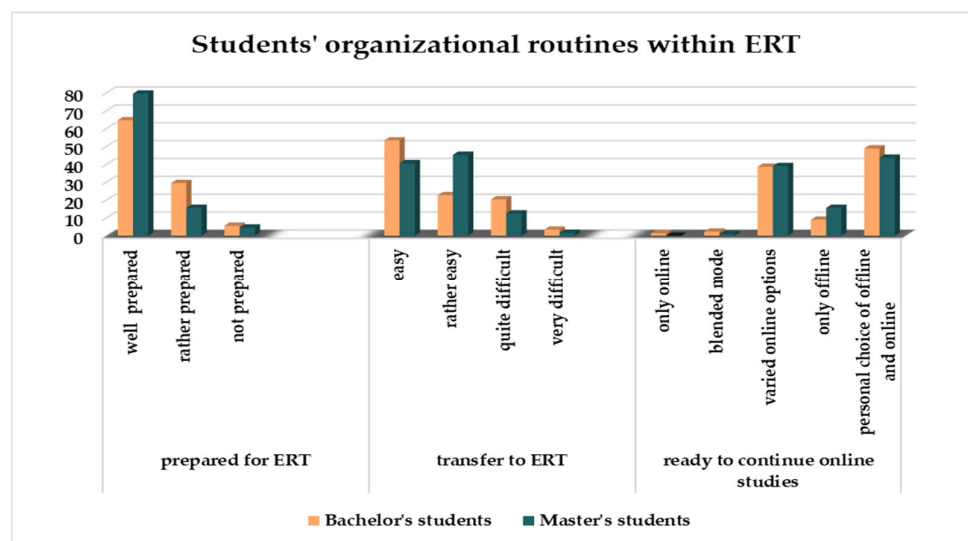

Figure 4. Organizational routines of students within ERT.

Approximately 65% of bachelor's students and 70% of master's students reported that they felt quite prepared for emergency remote teaching (ERT). Additionally, about 53% of bachelor's students and 41% of master's students found the transfer to ERT easy or rather easy, 23% and 45%, respectively. Interestingly, 39% of bachelor's and master's students reported that they would like to have varied options of online learning, as well as approximately 49% of bachelor's students and 44% of master's students claimed that they would prefer to choose the instructional mode themselves.

According to 53% of both bachelor's and master's students, the most positive aspect of ERT was the fact that students did not have to spend their time commuting to the university campus. Meanwhile, lack of communication was thought as the most negative aspect of ERT among bachelor's students (20.4%). The most negative feature of ERT identified by master's students was insufficient number of personal consultations with professors (21.8%). Additionally, both bachelor's and master's students reported that their study load significantly increased, 19.3% and 17.2%, respectively. Moreover, 19.2% of bachelor's students were unsure if they had covered the educational program in full, while only 9.4% of master's students expressed the same concerns. Interestingly, 15.9% of bachelor's students and 12.5% admitted having some difficulties in processing instructional content online.

3.1.2. Emotional Well-Being

Considering varied factors that might cause psychological imbalance during online studies, we formulated a set of questions to identify possible causes of psychological stress among students who had to experience ERT.

The charts below demonstrate the results obtained after surveying bachelor's and master's students (Figures 5–8).
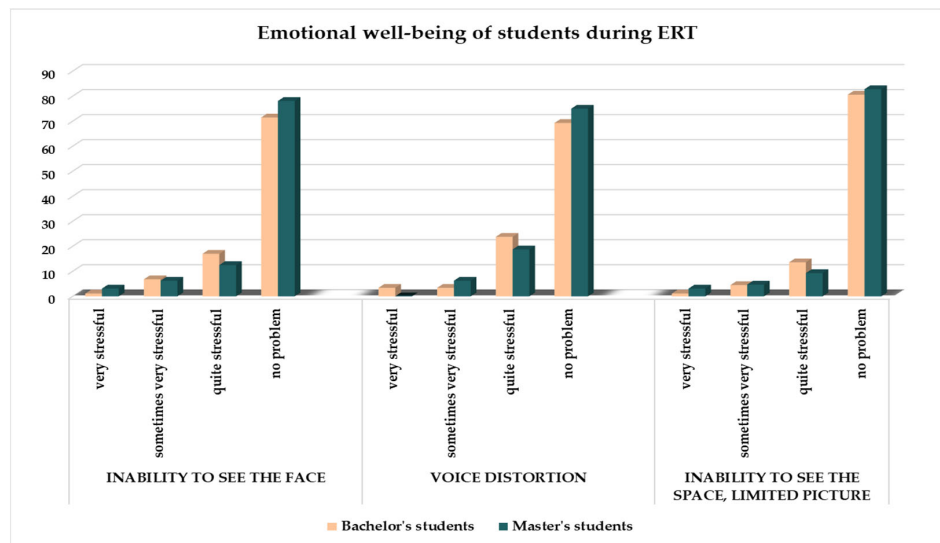
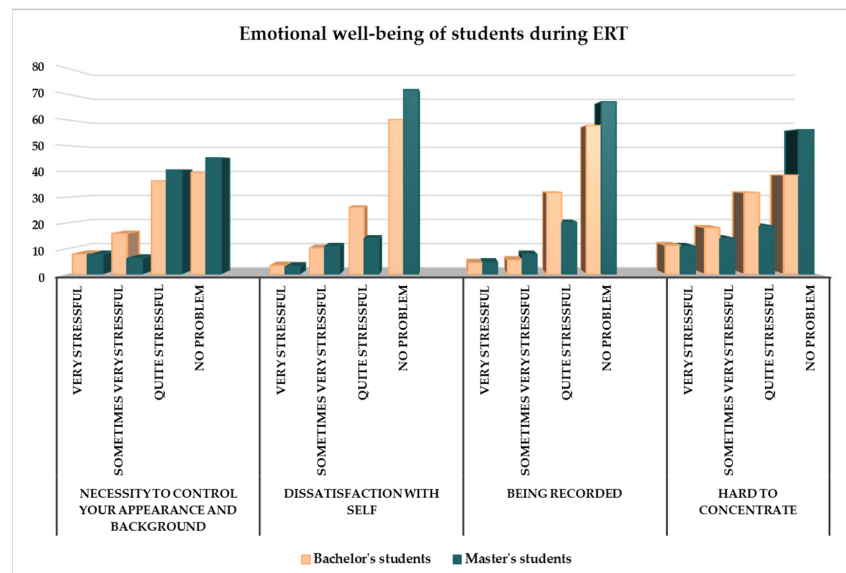**Figure 5.** Emotional well-being of students during ERT.

Figure 6. Emotional well-being of students during ERT.
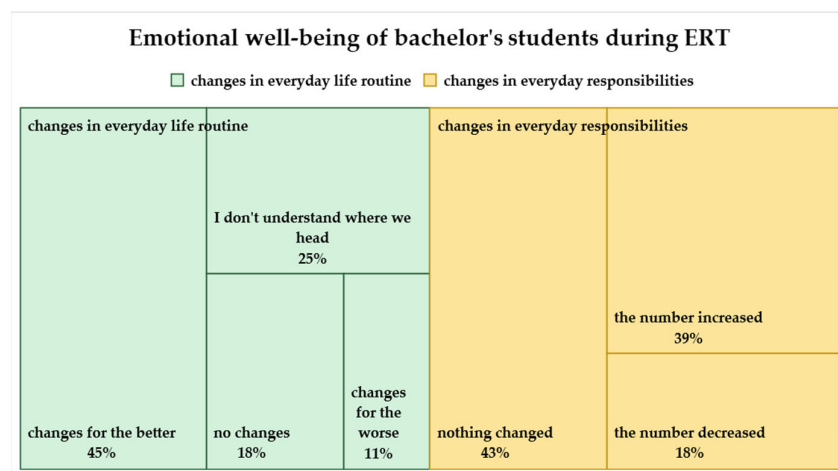
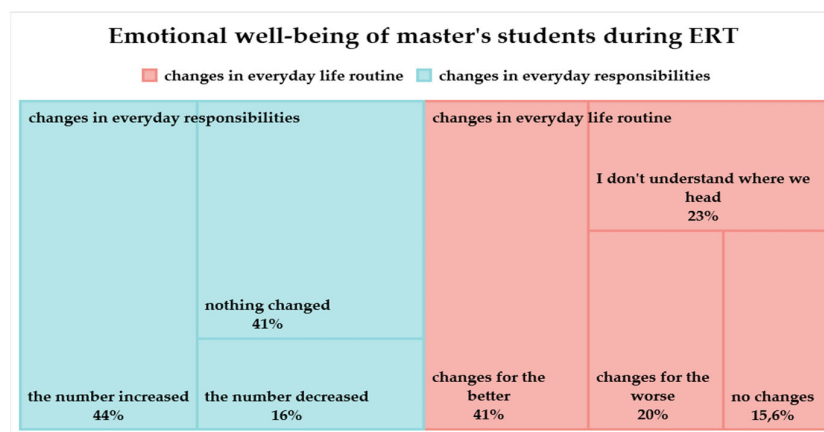**Figure 7.** Emotional well-being of Bachelor students during ERT.

Figure 8. Emotional well-being of Master students during ERT.

The obtained results revealed that the majority of bachelor's and master's students did not experience any discomfort in situations when they could not see the faces of other students, their voices were distorted, or there was no opportunity to see the whole classroom background. However, ~24% of bachelor's students and ~19% of master's students reported that their voices distortion was quite a stressful factor during synchronous online sessions (Figure 5).

Additionally, ~36% of bachelor's students and ~41% of master's students reported that, in situations where they had to switch on their cameras, the necessity to control the background and appearance was quite stressful, whereas ~37% of bachelor's students and ~45% of master's students did not consider this factor stressful. Moreover, the majority of respondents (~60% of bachelor's students and ~72% of master's students) were quite satisfied with their online image and they did not experience any discomfort being recorded during online sessions, ~58% of bachelor's students and ~61% of master's students, respectively. The most stressful factor identified by the students was attributed to occasional difficulties with concentratiion while studying online. In this regard, ~32% and 18% of bachelor's students found it quite stressful or very stressful, whereas only ~19 and 14% of master's students reported eing under stress to the same extent (Figure 6).

The survey also disclosed the students' perceptions of occurred changes in their daily routines and work/study responsibilities. In this regard, 45% of bachelor's students claimed that their daily lives changed for the better, 18% of the same group of respondents did not feel great changes, and only 11% of students viewed the changes from a negative perspective. However, 25% of students were rather perplexed and expressed concerns about the future. Additionally, 43% of respondents stated that the scope of their responsibilities remained quite the same, while 39% identified an increase, and 18% reported a reduction. The percentage of responses from bachelor's students discussing changes to their daily responsibilities and routines is shown in the treemap chart below (Figure 7).

The master's students declared that their responsibilities remained quite the same (41%) or fairly increased (44%), whereas only 16% of respondents identified a decrease. Meanwhile, 20% of master's students admitted that their lives changed for the worse and 24% were worried about their future. However, 41% of respondents were quite positive about the changes in their lives and 15.6% stated that they did not feel any major changes at all. The treemap chart below depicts the percentage of responses from master's students clarifying how their daily routines and responsibilities changed during ERT (Figure 8).

3.2. Pedagogical Domain

3.2.1. Delivery Mode

In terms of delivery mode, students were asked to assess the benefits and pitfalls of online learning as well as the organization of it by the university during the COVID-19 outbreak.

The obtained results showed that the vast majority of students were quite satisfied with the organization of online learning at university, namely, ~45% of bachelor's students marked 4 and ~55% of master's students marked 5 (Figure 9).
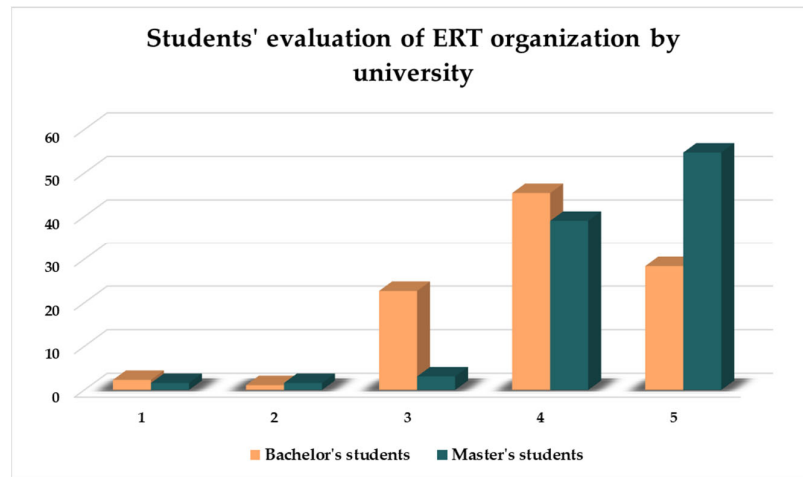

Figure 9. Students' evaluation of ERT organization by the university.

Regarding the instructional mode, both bachelor's and master's students expressed their willingness to blend online and offline learning (Figure 10). For instance, approximately 41% of bachelor's and master's students stated that they would like to have up to three online courses in their curriculum. Additionally, ~34% of master's students and ~34% of bachelor's students would agree to have more than three online courses in their educational program. Interestingly, ~50% of bachelor's students would like to have blended courses designed for two to three disciplines, whereas 39% of master's students would agree to blend all courses in their curriculum. Moreover, the vast majority of students stated that the disciplines they studied were quite suitable for online learning (Figure 10).
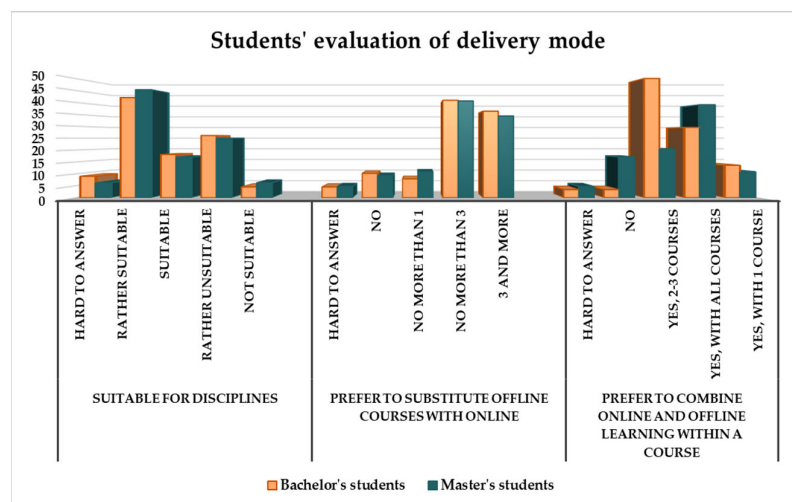
Figure 10. Students' evaluation of delivery mode.

Regarding the duration of online classes, ~51% of bachelor's students and ~61% of master's students believed that the optimal duration for online sessions should be no more than 60 min. In terms of personal data security, ~37% of bachelor's students and 42% of master's students did not express any concerns about their personal data leakage, while ~41% of bachelor's students and ~44% of master's students assumed the confidentiality on the Internet was not possible at all.

This part of the survey also included several qualitative questions for which students could choose more than one option. The results showed that ~65% of bachelor's students believed that the main benefits of online learning were the opportunity to organize the study process on their own and the possibility to rationally allocate the time spent on their studies (~60%). Additionally, 54% of students appreciated the opportunity to go back through video materials (recorded lectures and tutorials) while preparing for exams. Similarly, ~68% of master's students stated that the core advantage of online learning was attributed to the possibility of organizing their studies in the most efficient way, as well as ~65% found the opportunity to distribute their time effectively the most valuable. The master's students also stated that recorded lectures and tutorials were quite helpful during their preparation for exams (57%).

As for the downsides of online learning, ~24% of master's students stated that one of the most negative aspects was the unstable Internet connection. Additionally, ~26% of students claimed that they had to spend more time studying online because it was much harder for them to concentrate on instructional content. Moreover, ~37% of respondents wished they had more opportunities to communicate with professors and receive more feedback on their work. Interestingly, ~23% of students stated that instructional content and course requirements were easier in comparison to offline, which they considered to be a drawback. Rather similar results were obtained after surveying bachelor's students. About 35% of bachelor's students rated problems with the Internet connection as one of the most negative aspects of online learning. Additionally, ~55% of bachelor's students reported having problems with concentration during online sessions, which they considered to be the major downside of online learning in general. Moreover, ~26% of students believed that instructional content and course requirements were easier, which generally reduced the value of online learning. In addition to this, ~33% of bachelor's students would like to have had more opportunities for communication with professors and feedback. It is also worth mentioning that both bachelor's and master's students considered online learning to be more boring than traditional face-to face studies, 19% and 17%, respectively.

From the students' perspective, the most important aspect of online learning is its well-established and transparent learning path, which ideally should be differentiated according to the educational needs of learners. This idea was supported by 74% of bachelor's students and 67% of master's students. The second important aspect of online education identified by respondents was the instructional content, specifically, its topic-relatedness and conciseness. In this regard, ~62% of master's students and 59% of bachelor's students stated that the instructional content should be compressed and contain the most valuable information for further studies. Regarding teaching methods, both bachelor's and master's students rated recorded lectures and proper LMS with discipline-related materials as the most effective methods for online learning, 72% and 67%, respectively.

3.2.2. Academic Results and Achievements

The obtained results showed that the majority of bachelor's and master's students were quite satisfied with their academic results (Figure 11). Moreover, ~72% of master's students stated that their academic achievements remained quite the same and ~23% of respondents believed that they improved. As for bachelor's students, ~49% of students concluded that they had better academic achievements and 42% stated that they remained the same.

Both bachelor's and master's students gave high marks to their knowledge, namely, ~47% of master's students and ~48% of bachelor's students marked 4 (Figure 12). Moreover, the students were quite satisfied with the quality of teaching and evaluated positively the work of professors during ERT.
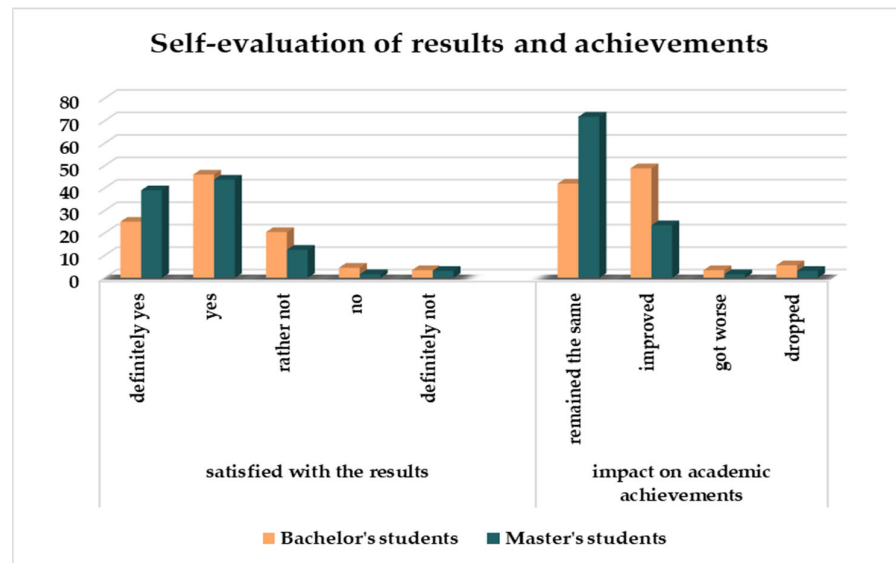
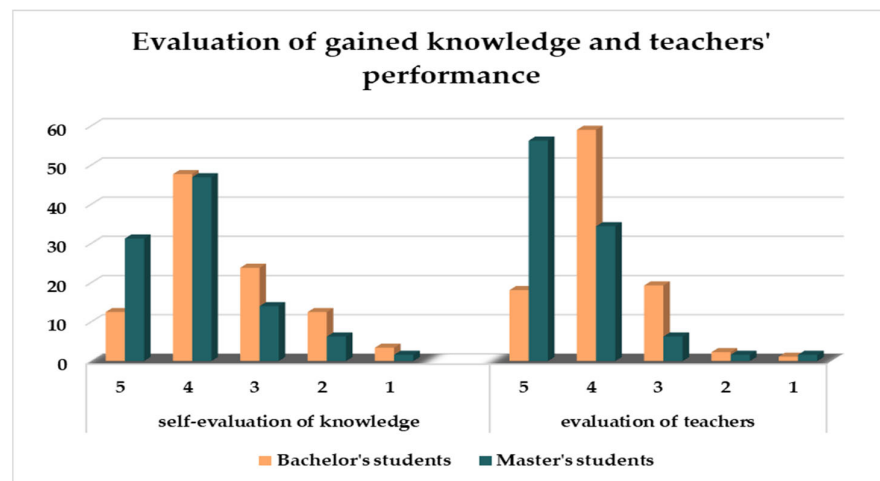**Figure 11.** Self-evaluation of academic results and achievements during ERT.

Figure 12. Evaluation of gained knowledge and teachers' performance during ERT.

3.2.3. Use of Digital Tools

Students were asked to assess whether the digital tools used during ERT were convenient for them.

Both bachelor's and master's students claimed that the average time spent on these platforms was about 1–2 h a day, ~45% and ~47%, respectively. The most convenient elements of MS Teams were videoconferencing and the possibility for recording the sessions. This option was supported by 76% of bachelor's students and ~78% of master's students. Moreover, the opportunity to send messages to professors was positively evaluated by ~78% of bachelor's students and ~65% of master's students. As for LMS Moodle, ~35% of bachelor's students stated that it was quite beneficial for taking tests, whereas ~27% considered it to be minorly useful. Rather similar results were obtained among master's students, ~42% of respondents rated LMS Moodle as fairly useful, being mostly applicable for tests and materials (lecture notes, PowerPoint presentations) storage.

4. Discussion

The COVID-19 outbreak sharply changed the educational process, putting a lot of pressure on both students and educators. This experience, conceptualized as emergency remote teaching (ERT), provoked a scientific discussion on the viability of existing methodologies

and teaching strategies, the overall effectiveness of online learning, and the current pitfalls of digital education. This study aimed at identifying the psychological and pedagogical strains within ERT to conceptualize an instructional framework that could enhance both teaching and learning practices. The results of the study, which will be further discussed, are meant to envisage the context for those who design curriculum and online courses as well as suggest recommendations regarding key aspects of online learning in situations of emergency transit.

4.1. What Psychological and Instructional Difficulties Did Students Experience during ERT?

The studies suggest that one of the core psychological difficulties that students experienced during ERT was their inability to concentrate during online sessions [45]. According to our study, the vast majority of respondents reported having problems with concentration and an inability to focus during online sessions. As a result, they suggested shortening synchronous online sessions to 60 min instead of the traditional 90 min. This suggestion is actually well-supported by studies focusing on the students' attention span. The studies show that the optimal duration of a face-to-face lecture might be up to 50 min; however, educators should consider the students' "attention swings", as the attention span of learners typically reduces after 15 min of intensive listening [31]. This situation demands planned lecturers' interventions during the session to keep students involved and help them process the information effectively. Despite the fact that this issue is being researched in the context of face-to-face learning, studies related to the optimal duration of online sessions are scarce. As a result, it becomes quite difficult to establish the time limit that could enable learners to study effectively and avoid fatigue or cognitive overload. The ERT experience showed that following conventional time norms for offline sessions was not that effective from the students' perspective. This issue definitely has to be addressed and rethought from the perspective of instructional design for online courses, including ERT.

Moreover, our study showed that both master's and bachelor's students considered some sessions to be quite dull. In our opinion, one of the possible reasons was the lack of interactivity during online sessions. Online learning should be interactive to the extent that it helps learners stay involved and be a part of the learning process [46]. It means that even during the lectures, it is essential to interact with the audience not only by means of visual content. This would require careful design of visual communication strategies, activities, and instructional stages of an online session.

Another important issue that has to be addressed while designing or redesigning online courses for ERT is the manner and scope of the feedback to be given by educators. Our study revealed that both bachelor's and master's students experienced a lack of feedback and communication with professors during their studies. The importance of feedback and communication with instructors during the educational process is widely supported in studies [47,48]. Moreover, it becomes one of the central issues in online learning design. However, the forms and organizational strategies that could be employed in online education at universities still require further research and trial. As such, giving personal feedback might become rather overwhelming in terms of educators' regular workload. In this regard, this issue might require an intervention from the administrative board, which could result in introducing additional positions such as tutors or educational assistants, whose responsibilities would be primarily around supporting learners during their online studies and providing prompt feedback.

According to the results of the conducted survey, both bachelor's and master's students identified the necessity of adjusting instructional content for online learning. These adjustments should address the conciseness, relevance, novelty, clarity, and compression of the learning material. These qualities become particularly important to consider self-studies of learners and the time they should spend on independent learning. Additionally, clear instructions, recommendations, and deadlines should be provided in full, so that the learners, in situations of limited opportunities to contact educators, have a clear vision of the aims and requirements for a specific learning module as well as for the entire online course. An

interesting fact in this regard is that ~24% of bachelor's and master's students stated that the requirements of online courses were easier than those of offline ones, which they did not consider an advantage. This, actually, corresponds to the assumption that instructional materials and tasks in an online environment should be graded, represent a certain level of difficulty, and include transparent, comprehensible, and concise requirements [49].

Some results of our research are aligned with the findings of other studies related to students' ERT experiences, in particular the ones revealing problems with concentration among students, increased study load, technical issues, favorable methods of online learning (lectures recordings, key notes or lecture notes) [34,36,50]. However, some of our findings contradict certain assumptions related to students' overall perception of ERT.

Several studies described the negative impact of the lockdown and ERT on students' study routines and personal lives [37,39,42]. It has been reported that lockdown completely changed students' perception of studies, which resulted in seeing ERT as a mostly negative experience. In contrast, our study identified a low level of negativity towards ERT and online learning in general. Only about 5–7% of bachelor's and master's students reported a totally negative reaction towards ERT. On the contrary, a great number of students believed that they had not experienced changes that completely transformed their habits and study routines. They viewed ERT as an opportunity to independently regulate their pace of learning. However, it is still necessary to mention that around 22% of master's and bachelor's students expressed concerns about their work and study prospects, which might be explained by an increased level of anxiety caused by social uncertainty during the pandemic and lockdown.

The benefits, pitfalls, and effectiveness of online learning are widely discussed by researchers [51,52]. In broad terms, there are two opposing opinions. On the one hand, it is claimed that online learning is as effective as traditional learning. On the other hand, it is reported that online learning is less effective than a traditional instructional mode. Both arguments have their merits; however, students' perceptions of online learning effectiveness have not been widely taken into consideration in existing research. The results of our study showed that students' evaluation of gained knowledge was quite positive. They reported that organized online studies were effective enough to achieve the desired learning outcomes. Moreover, students admitted that they would like to have blended courses in their curriculum. These results might be driven by the fact that the majority of learners had prior experience with online learning. So, they were quite familiar with the technologies and common educational practices for online learning. Nevertheless, this could also mean that students generally believe in the effectiveness of online learning and see its core educational value in possibilities of designing individual learning paths. In this regard, when it comes to the evaluation of online learning effectiveness by researchers, it is of equal importance to assess not only learners' results but also the instructional solutions and technologies employed by educators in each particular case.

The discrepancy in research findings regarding the level of satisfaction with ERT among students, in our mind, might be explained by cultural differences and the culture of learning that underlie learners' abilities of social and psychological adjustment to critical educational situations. In this regard, a cross-cultural study on psychological and social mechanisms involved in overcoming crisis situations in education might disclose some factors influencing learners' adaptability skills. Additionally, consideration should be given to learners' personalities and propensities, which form their patterns of social and intellectual behavior.

4.2. What Educational Theories Should Underpin the ERT Instruction as a Type of Online Learning?

The results of our research showed that students' perceptions of ERT, by and large, fitted into the context of instructional design for online learning. Students would appreciate prompt and personalized feedback, clear requirements and learning paths, varied presentations of instructional content (recorded lectures, key notes, presentation, and visuals), and

interactivity during the learning process. These preferences of students replicate existing considerations on instructional design for online learning.

As previously discussed, recent educational models for online learning rely on social constructivism as a pedagogical theory, that focuses on collaboration, knowledge construction, and reflection while designing activities and instructional content [16,17,19]. The social environment, and in the case of online learning—the online learning community, plays a pivotal role in the educational process based on constructivism. The ERT case showed that in a crisis situation, this approach was not fully implemented, although it could have become the optimal solution, especially, in terms of reducing the level of students' anxiety and desocialization. One of the reasons, surely, is related to the technological resources of educational institutions, which, in some cases, hindered the creation of a centralized online learning community for learners and educators. Additionally, the immediate transition to online learning showed that although a lot of universities were aiming to incorporate an online component into their courses, these solutions were not flexible or adjustable enough.

Therefore, the other reason lies in the area of instructional framework applicable for emergency remote teaching. Specifically, the factor of the abrupt transition to online instructional mode appeared to be a cornerstone for the majority of educators and institutions [3,53]. This could mean that the stage of course conceptualization requires a more universal and flexible design approach that could enable educators to adjust developed syllabi in the most efficient manner in case of a social demand.

4.3. What Instructional Framework Could Be Possibly Used to Satisfy the Educational Needs of Learners within ERT and Ensure a Smooth Transition to Online Mode in Case of Emergency?

Instructional design for online learning has been conceptualized as a scientific field, the focus of which is on the most effective instructional design models and instructional frameworks for teaching, learning, and materials development [54,55]. According to the existing body of literature, one of the most popular instructional design models is ADDIE, which stipulates the consecutive accomplishment of several stages: Analyze → Design → Develop → Implement → Evaluate. The implementation of this design model allows educators to develop courses that cater to the needs of learners and enables them to acquire the necessary knowledge and skills for specific educational and professional contexts.

The practice of ERT showed that there was no time for implementing this cycle as the courses had already been developed. Thus, the whole process of transition mostly involved adapting learning content and assessment procedures to new educational circumstances. This strategy was not effective enough, as learning content and assessment techniques are components of a holistic instructional system. Specifically, this system should have been redesigned. From this standpoint, the transition could have been more effective if the overall approach to courses redesign had relied on the following stages: Revise → Adjust → Develop → Implement → Evaluate.

The revision stage would include rethinking developed system components: reselection of learning content, instructional framework, technologies, and ways of student–student and teacher–student interaction. The adjustment stage would involve the alterations to developed instructional content (what learning content should be delivered synchronously/asynchronously, what methods, activities, and technologies could be used to deliver this content, etc.), and educational interaction routines. The development stage would be focused on redesigning learning materials for online usage and adjusting technologies to meet educational needs. The implementation and evaluation stages would stipulate the delivery of the redesigned course and the evaluation of its efficacy.

From our perspective, the redesign process during ERT would have been easier if educators had initially adopted a more flexible and universal approach to developing offline or blended courses. This approach could be based on the following considerations:

- Ensure balanced use of technologies. The use of technologies in classrooms should be approached from a pedagogical perspective. Technologies are the tools that help shape the form of a lesson, make it more interactive, ease the educational process,

and set the necessary educational context, but they cannot substitute the instructional content. Unfortunately, sometimes the intensive or chaotic use of technologies during the classes overlaps with their educational value or creates additional difficulties and misunderstandings during the learning process. Therefore, the use of technologies should be justified by the educational approach, learning objectives, classroom dynamics, and instructional content. In this regard, it might be quite effective to choose one platform to be used as LMS and make a limited list of other technologies that could benefit the course or substitute the existing solution once it is needed;

- Select, expand, and compress the learning content. The learning content should correspond to the learning objectives and the educational needs of learners. However, with respect to the initial proficiency level of students and their ongoing academic development, this content can be expanded or compressed. Educators should plan the ways to adjust learning content and activities to ensure the development of students' skills and knowledge during the courses they design;
- Include multiple modes to deliver content. Learning is most effective when material is presented in multiple forms, and when students have multiple means of interacting with this material. Instruction should be designed to meet the needs of a broad range of learners' preferences and allow them to gain personalized learning experiences with respect to their learning styles;
- Introduce the culture of assessment and evaluation. Students' assessment and feedback are important parts of any learning process; therefore, the culture of assessment and evaluation should be established at the very beginning of any course. This would stipulate the design of varied forms for students' assessment and feedback strategies (personalized, peer, and teacher-student);
- Differentiate the levels of learners' involvement. Some students are quite active and easy-going by nature; some are not. Those who do not possess strong communication and leadership skills should not be graded lower than others. Additionally, some learners are motivated for only "A" results, while others do not have the drive or abilities to complete all of the course requirements in full. This means that a designed course should enable learners to realize their learning potential in the most preferable manner; it should include differentiated activities, varied tasks and forms of assessment, and provide learners with opportunities between them. To complete that, it would be quite beneficial to plan an online component for extra practice and formative and summative assessment;
- Create a collaborative environment. Since learning experiences that are active, social, contextual, and student-centered lead to deeper learning, it is important to create an environment in which learners have opportunities to unite their intellectual efforts in order to deal with a task, communicate for meaning, or develop a certain product. This would mean blending different forms of pair, group/team, and full class work;
- Set clear objectives, expectations, and requirements. Students become more involved in the process and have realistic course expectations when they understand the objectives, learning outcomes, and requirements of a course. Therefore, setting clear expectations and explaining requirements would mean to have "an agreement" with learners, which would help both educators and students stay on track and reach educational goals;
- Ensure the use of active methodologies for learning and teaching. The benefits of active methodologies for learners are widely discussed and researched in the literature. It is no doubt that the learning process should be engaging, practice-oriented, contextual, and social. Therefore, educators should plan activities that involve learners in intellectual work and provide them with opportunities to communicate and learn from each other.

In our opinion, the presented considerations could constitute the instructional framework that benefits educators at the stage of course conceptualization. Following these principles would allow a smooth transition to another instructional mode and reduce the scope of work to be carried out in cases of educational emergencies.

However, this study has some limitations. These limitations are related to the respondents' profiles. The sampling pool included students pursuing bachelor's and master's degrees, but it did not embrace post-graduate students. Additionally, international students were not included in this sample, as the majority of them had signed up for blended-learning courses before ERT. Finally, the majority of respondents had previous experience with online learning, so the findings regarding students' perceptions of ERT may vary for those who had never experienced online learning before.

5. Conclusions

The outbreak of the COVID-19 has considerably changed teachers' and learners' perceptions of "pedagogical norms" and questioned the efficacy of well-established teaching practices. The challenges that occurred during an extreme transition to online education initiated a debate about the potential and efficacy of online education, its instructional models, and frameworks.

This paper aimed at identifying the pedagogical and psychological aspects of ERT as a form of online education that could underly the design of a more flexible instructional framework. The suggested instructional considerations are based on the analysis of theoretical assumptions regarding teaching the principles of online education as well as the results of the experiment conducted for this study. These principles, namely, (1) ensure balanced use of technologies, (2) select, expand, and compress the learning content, (3) include multiple modes to deliver content, (4) introduce the culture of assessment and evaluation, (5) differentiate the levels of learners' involvement, (6) create a collaborative environment, (7) set clear objectives, expectations, and requirements, and (8) ensure the use of active methodologies for learning and teaching, could guide educators during a course design and allow a smooth transition to another instructional mode in cases of educational emergency.

Future studies in the area of ERT and post-pandemic pedagogy may focus on: (1) analyzing and comparing cultural attributes of psychological and social adjustment mechanisms in situations of educational crisis; (2) identifying the psychological constraints of learners during online education, as well as the factors that help reduce their level of stress; (3) designing instructional and psychological strategies for retaining learners' attention span during online sessions; and (4) developing physiological, psychological, and instructional norms within online education for different age groups.

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