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Reference framework for inclusive digital education

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Acronyms

DELT	Digital Enhanced Learning Teaching
EC	European Commission
HEI	Higher Education Institution
ICT	Information and Communication Technology
IDEA	Inclusiveness Digital Access
LTA	Learning, Teaching and Assessment
MOOC	Massive Open Online Course

Executive Summary

Coronavirus (COVID-19) has underlined that a crisis requires immediate and decisive action by organizations irrespective of the type of the organization. In the education sector, universities had to move their courses online almost overnight. Many universities were not prepared for this transition which affected the education process with both lecturers and students impacted, especially those with less-than-ideal circumstances among them. The pandemic changed the rules of higher education and it is now certain that online education will never be the same, neither in terms of audience nor in the terms of online teaching.

The objective of the IDEA project is to support the transition towards a more inclusive digital education, by adapting the pedagogy of the faculty. It is centered on the concept of inclusiveness which was largely ignored in the online education environment before the COVID-19 pandemic and its crucial contribution to the provision of quality digital education was underestimated.

The project aims to

- understand and build awareness around the importance and necessity of inclusiveness in digital education;
- develop a quality assurance system that embeds inclusiveness in all phases of the digital pedagogy; and
- develop practical tools that guide faculty members through the evolution of their pedagogical practice.

This “Reference framework for inclusive digital education” report is the outcome of a work package that aimed at mapping of the requirements for inclusive digital education and identifying key learning points of COVID-19 induced transition. The relevant data for the report were collected by a series of different types of interviews and a large-scale survey that involved students and lecturers from the IDEA's project participating European countries (Belgium, Bulgaria, Estonia, France, Italy, and Poland).

Findings

Online education was found to be more flexible and convenient for students, especially the more mature ones while freshers suffered the most. In some instances, female; local; and students with special needs were more activated in comparison to other student groups. Major drawbacks are the decreasing motivation and engagement of students, with a growing sense of isolation due to the lack of human contact, difficulties in joint and practical activities. Missing empathy with a few lecturers was also found.

The content, pedagogy and assessment methods needed to be redesigned for a digital-first education, with a more practical approach and less theory. Lecturers had the chance to try several digitally enabled tools and methods, which some proved successful in engaging and including more students, like breakout rooms and chat. Still, face-to-face education was widely voted to continue, whereas the hybrid approach was frowned upon due to the inequalities it invokes between online and in class students.

Digital exhaustion was a common problem cited by both students and lecturers. The multitude of platforms they had to deal with did not make the situation any better either,

especially with a significant number of lecturers self-reporting that their digital skills need improvement and the suboptimal status of the technology infrastructure in HEIs impacting the educational process.

A cluster analysis was performed to identify discrete groups of students to propose more specific recommendations for each group. Four groups were identified: the unmotivated student, where students were less inspired to engage in online classes with a lack of cordial relationship with lecturers. The inactive students, where lecturers' attention was directed to others. The digitally activated students, who were motivated by online classes to participate in discussions. Finally, the mature students who were mostly working graduates found digital education satisfactory and convenient.

Best practices

Throughout the hurried digital transition amid the COVID-19 pandemic, lecturers from participating HEIs came up with and some tried several tactics that would help overcome the challenges they faced. Those “best practices” were grouped into four categories: pedagogy, environment, communication, and psychological health.

Some of the highlighted best practices related to pedagogy include the need to clearly define and communicate course structure well in advance, record lessons and make them available online, establish regular evaluation methodology, and use interactive tools to promote interactions. When it comes to the environment in which the students and lecturers learn/teach, especially the digital one, upgrading the IT infrastructure and the support provided to staff and students while training them in the missing digital skills was highlighted. Also, they urged HEIs to standardize and unify the platforms they interact with, whenever possible. It was pointed out that clarity and coordination of messages is essential for improved communication in the digital environment while engaging in small talk with students and colleagues, and organizing regular events would help reduce uncertainty and stress.

Recommendations

Based on the research findings and the best practices inferred, several recommendations are herewith put forward to improve inclusiveness in digital education within HEIs. The highlights of which include:

- Inclusiveness and engagement strategies in digital education have to be tailored for different student groups based on their backgrounds, profiles and behaviours.
- Training and upgrading staff, and to some extent students', skills is a necessity. This refers not only to digital skills but also to cultural and interpersonal ones.
- Face to face education remains essential to humanize the learning experience and implement practical activities.
- Digital technologies should be applied to transform educational pedagogies and support learning journeys, but not relied upon as the core proposition.
- Content and methods need to be designed specifically for online environments.
- A shared understanding and coordination of inclusive strategies in digital education is needed among the different schools, departments, admission and student support offices in HEIs.

TABLE OF CONTENTS

1. Introduction	7
Background to the report	7
Objective of this report	8
Methodology	8
2. Background literature	9
Digital education	9
Inclusiveness in digital education	11
The state of digital inclusiveness in Europe	12
3. Findings	13
Qualitative findings	13
Lecturers' findings	15
Inclusiveness in digital education	15
Engagement with students	15
Personal and social challenges	16
Pedagogy	16
Technology and digital tools	16
Students' findings	17
Motivation	17
Convenience	17
Personal and social challenges	17
Pedagogy	18
Technology and digital tools	18
Quantitative findings	19
Demographics	19
Students findings	20
Motivation to learn	20
Comparison between on-site and online classes	21
Perception of online teaching regarding inclusiveness	22
Perception of digital skills and tools	23
Lecturers' findings	24
Diversity and cultural differences	24
Perceived personal challenges in digital teaching	26
Stress assessment - Technological stress	26
Stress assessment - Burn out	26
Motivation regarding online teaching in general	26
Interim result	26
4. Findings of Cluster Analysis	27
Cluster 1 - The unmotivated student	27
Cluster 2 - The inactive student	28
Cluster 3 - The digitally activated student	29
Cluster 4 - The mature student	29



5. Lessons learnt and best practices	30
Pedagogy	31
Environment	32
Communication	33
Psychological health	34
6. Recommendations	35
7. Conclusion	36
References	38
Appendix	43

1. Introduction

Background to the report

The COVID-19 crisis forced Higher Education Institutions (HEIs) to move their learning, teaching and assessment (LTA) activities online almost overnight. Many were not prepared due to the lack of information and communication technology (ICT) or because of the lecturers' insufficient digital skills. The HEIs response was often limited to broadcasting the same lectures online, without adapting neither their programmes nor their teaching methods. Possibilities for exchange of ideas between faculty and students, students' participation and small group cooperation, which are all essential to high-quality pedagogy, decreased dramatically. For example, in the WebGeneration survey from September 2020, 61% of the students reported that the experience of online learning failed to match that of classroom learning. Many students (in particular the vulnerable ones, i.e., those needing more support and accompaniment) disengaged from the learning process. To address the consequences of this development, lecturers at HEIs must be supported so that they can design and deliver teaching, learning and assessment methods that allow all students to engage meaningfully with their respective needs and study programmes in order to realize their full potential.

The 2-year Erasmus+ project (2021-2023) project (Inclusive Digital Education Access) IDEA, of which this report is part of, aims to analyse and support the transition towards a more inclusive digital education, by adapting the pedagogy of the faculty.

The project aims to:

- understand and build awareness around the importance and necessity of inclusiveness in digital education;
- develop a quality assurance system that embeds inclusiveness in all phases of the digital pedagogy; and
- develop practical tools that guide faculty members through the evolution of their pedagogical practice.

The IDEA project is centred on inclusiveness digital education in HEIs. Inclusive digital education is understood as the provision of a digital education without barriers that respects diversity and ensures that the variety of learning needs is considered. Diversity in this project goes beyond gender to include age, cultural background, mode of study, and students with special needs among others. It allows meaningful interactions between students and faculty as well as between students themselves, sustains student engagement, and encourages their active involvement in all activities at the university. It is achieved through a responsible approach to designing, delivering, and assessing methods ensuring that no student is left behind. A concept that was largely ignored by the digital education environments before the COVID-19 pandemic, while its contribution to the provision of quality digital education was largely underestimated.

The project's partnership was selected to reflect diversity and complementarity. It includes five HEIs (i.e., Université libre de Bruxelles, Poznań University of Economics and Business, Tallinn University of Technology; New Bulgarian University and Jean Moulin Lyon 3

University), a network for quality and accreditation (EFMD AISBL) and one adult education provider (CONFORM-Consulenza, Formazione e Management S.c.a.r.l.). All partners come from countries with different levels of inclusiveness and digital advancement in education. The primary target groups of IDEA are lecturers, faculty members, programme / academic directors and other members of management, who design the curriculum, coordinate the courses and oversee their delivery and quality, taking into account the students' needs; who are the beneficiaries of this project.

Objective of this report

To reach the objectives mentioned in the previous section, the IDEA project is divided into four work packages (intellectual outputs). The findings presented in this report refer to the first work package "Reference framework for inclusive digital education". Thus, this work package maps the expectations of students and lecturers in terms of inclusiveness and analyses the pedagogical approaches that have been introduced to adapt the pedagogy to the new constraints. The work package is divided into two components: Component 1: Mapping of the requirements for inclusive digital education and Component 2: Key learning points of COVID-19 induced transition. The findings of the activities are presented in this report.

Methodology

To gather the necessary information needed for developing a "Reference framework for inclusive digital education", a mixed methods approach was selected. Mixed methods research involves the collection, analysis, and mix of qualitative and quantitative research techniques and are often used when the research challenge indicates that the findings of a mono method will not sufficiently help address this challenge. A circumstance that existed in the situation described. Consequently, the research process was structured in two phases: A qualitative and a quantitative phase.

- **Qualitative Phase:** The purpose of this phase was to gather information about the needs regarding inclusive digital education and key learning points of COVID-19 induced transition. Data was collected by the means of individual in-depth interviews and focused group interviews - offline and online - between May - June 2021. The partners used an interview guideline that was specifically developed for the matter. In total more than 100 students and 30 lecturers were involved in this phase.
- **Quantitative Phase:** The purpose of this phase was to confirm and complement the insights of the qualitative phase. Data was collected in an online survey using Qualtrics (a survey tool). To collect the data a questionnaire instrument was developed by the partners based on validated items from current research on learning in higher education. Open questions were added to gather additional information which was not captured by the scales we used. The survey was conducted in the period August - October 2021 and resulted in 2109 usable responses¹.

To analyse the different types of data, a combination of methods was chosen such as thematic analysis, as well as descriptive statistics and a cluster analysis.

¹ Note: The data is unevenly distributed among the six countries (France, Belgium, Poland, Estonia, Bulgaria and Italy).

2. Background literature

Digital education

Covid-19 impacted each domain of society and reshaped each compartment of our life. Consequences on the educational sector have been strict lockdowns and the enforced closure of schools, colleges, and universities in many European countries. Yet, this has not meant the cessation of all learning, teaching and assessment (LTA) activities (Watermeyer et al., 2021). In the more specific context of universities, higher education providers had to move fast to provide a similar educational experience remotely via digital interfaces (Neary, 2020). Some universities and lecturers were unprepared and in doubt of their ability to cope with such transition (Raes et al., 2020). For lecturers as well as students, this was an unusual and disorientating experience. According to Watermeyer et al. (2021), it revealed that changes in higher education were overdue.

The availability and increasing use of technology has evolved considerably in all facets of life. This also includes the education sector (Allen and Seaman, 2017); different technologies have been implemented to facilitate and improve the learning process (Sánchez Prieto et al., 2020). Historically, the first college to offer an online curriculum, CALCampus, was established in 1994 in New Hampshire, US. The development and democratization of the internet with the beginning of this century, has further accelerated the development of e-learning. Universities who do not implement distance learning options might suffer from retaining their student population (Nakamura, 2017).

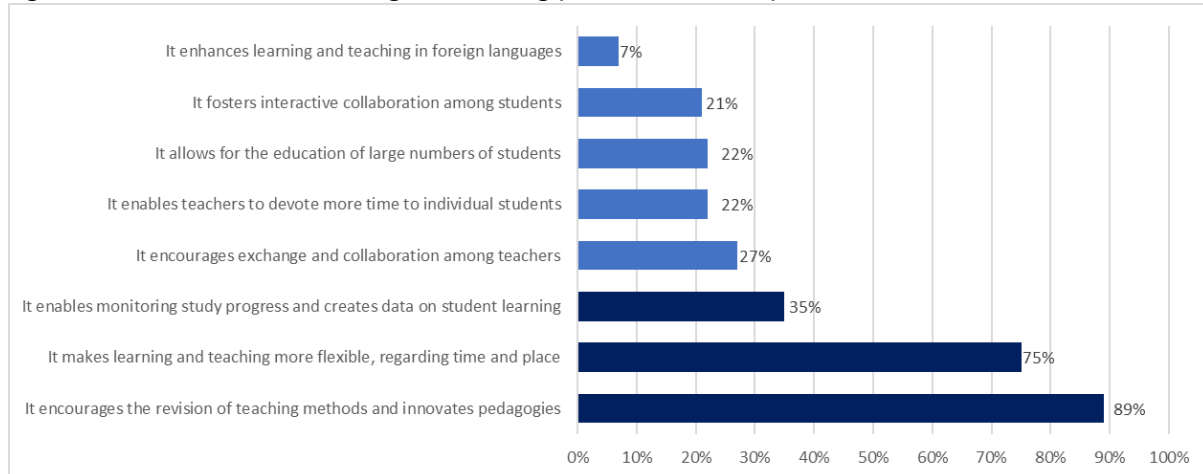
With the advent of the COVID-19 pandemic, digital preparedness of education became unavoidable, with Budur et al. (2021) emphasizing the crucial role of educational institutions in providing efficient information and communication technology (ICT) enhanced facilities to their lecturers and students, in order to deliver quality education. In Europe, various initiatives are regularly being launched with the aim of monitoring the evolution of digital education. For example, there is a list of Horizon projects in this field extending between 2021 to 2027, as reported by the European Court of Auditors (2021a).

The most common use of ICT in education is to facilitate the delivery of education online. Online education/ learning (e-learning) refers to the process of taking up courses over digital platforms (Liu et al., 2018). E-learning encompasses a range of activities: from supported learning to blended learning, hybrid learning and full online learning (Cruz-Jesus et al., 2016). These approaches are helping make higher education a more flexible and agile concept (Aikina and Bolsunovskaya, 2020), which is a necessary feature of modern education as the student engagement was found to be associated with positive learning outcomes (Fredricks, Blumenfeld, and Paris, 2004) and higher retention rates (Bote-Lorenzo and Gomez-Sanchez, 2017).

Some of the benefits of e-learning were reported in literature (Paudel, 2021). Bower et al. (2015) and Weitze, Ørngreen, and Levinsen (2013), found that it can ensure a more inclusive education and equality in learning. It is also more convenient for students (Li et al., 2018); allowing them to study anytime and anywhere. Thus, it saves them time and money (Vershitskaya et al., 2020), and increases their access to education (Shea and Bidjerano, 2014;

Fischer et al., 2020). Considering the learning outcomes, some found it to improve student performance (Jesus et al., 2017), and knowledge acquisition and satisfaction (Ho et al., 2016) in comparison with face-to-face teaching. Also, Gaebel et al. (2021) highlighted in a recent survey some benefits perceived from the institutions' point of view. Results of this survey summarize and complete what has been mentioned here above (see Figure 1).

Figure 1. Benefits of online learning and teaching (Gaebel et al., 2021)



Too often though, ICT is considered a “magic bullet” that can resolve numerous issues concerning learning and teaching as well as a way of making students more empowered and independent (Cuban 2004; Cuban and Jandrić 2015; Terräs et al., 2020). However, some scholars pointed out a certain discrepancy that exists between the promises and improvements brought by educational technology (Cuban et al., 2001; Cuban, 2004; Selwyn, 2010; Mertala, 2019). Others argued that e-learning has, at the very least, no impact on metrics such as test scores (White et al., 2010), motivation, needs satisfaction, or perceived success (Yen et al., 2018; Butz and Stupnisky, 2016).

As e-learning represents a different approach to education in terms of pedagogies and experiences, it is realistic to expect that it does not come without its own challenges that could affect the uptake, implementation, and the day-to-day usage of online learning methodologies by learners and educators. Gaebel et al. (2021), for example, report that “there were strong concerns regarding the potential negative impact of digital technologies on learning and pedagogies, the dehumanization of learning, the elimination of cultural diversity, enhancement of social inequality, and generally, the ushering in of commercialization of education” (p.12). In several studies, there are reports on students suffering a lack of motivation, interaction, engagement, and in turn retention (Ray et al., 2021; Panigrahi et al., 2018; Raes et al., 2020). This situation led to a feeling of self-isolation, anxiety and even depression (Hilliard et al., 2020; De Paepe et al., 2018; Lei and Gupta, 2010). Insufficient communication, empathy, and feedback from lecturers in online environments, might have contributed further to the situation (Lassoued et al., 2020; Fidalgo et al., 2020). Several other researchers revealed negative additional consequences on learning outcomes such as students' grades, course completion and continuing education (Atchley et al., 2013; Bettinger et al., 2017; Figlio et al., 2013; Jaggars and Xu, 2016).

Bates' (2011) work shed some light on lecturers-related challenges with regards to digital education. He argued that their fear of change is a main barrier to its adoption. Something that could undermine their digital literacy skills (Ustun and Tracey, 2020), and in turn the quality of online education delivered as it depends primarily on teachers' technological competence (Bower et al., 2015). In other studies, lecturers named inadequate support, lagging technology infrastructure and poorly defined e-learning strategy by their institution as major hindrances to e-learning (Ustun and Tracey, 2020; Graham et al., 2013; Tamim, 2018).

Existing literature also provides a series of recommendations not only to overcome the challenges of e-learning but also take advantage of the opportunities it presents. Ideas for accelerating its adoption and improving its effectiveness are highlighted as well. This is a pressing issue as Watermeyer et al. (2021) recommended that some adjustments are necessary to avoid the loss of the international status of universities and student exchange opportunities. On the institutions' side, universities are urged to provide flexible learning trajectories; giving the students the choice of studying online or offline (Raes et al., 2020), and enhance their technology infrastructure and support for both students and lecturers (Aikina and Bolsunovskaya, 2020). In addition, lecturers need to reconsider current pedagogies and redesign courses (Cain, 2015; Ramsey et al., 2016), and to enhance their digital skills to accommodate technological innovations (Sánchez Prieto et al., 2020). They also need to adapt common assessment methods to fit the digital environment and limit plagiarism (Aikina and Bolsunovskaya, 2020). Finally, students' motivation, engagement and satisfaction should be taken into consideration when designing e-learning courses; leveraging new tech-supported tools such as breakout rooms, polls, chats and quizzes (Raes et al., 2020; Raes and Depaepe, 2020) to ensure inclusion of all students, especially the marginalized and disadvantaged ones (Dobbins and Denton, 2017; Almahasees et al., 2021).

Inclusiveness in digital education

In connection with the objective of the IDEA project, we show here above that ICT tools and e-learning methods are supposed to facilitate teaching and learning activities and, above all, are supposed to ensure a more inclusive education and equality in learning. However, the question arises whether digital education is inclusive, and what are the requirements for inclusive digital education? To answer these questions, we must first refer to the definitions of inclusiveness in education in general and in digital inclusion specifically. Khanna and Kareem (2021) cited a definition for inclusive education from the MacKay report as "a pairing of philosophy and pedagogical practices that allow each student to feel respected, confident and safe so he or she can learn and develop to his or her full potential. It is based on a system of values and beliefs centered on the best interests of the student, which promotes social cohesion, belonging, active participation in learning, a complete school experience, and positive interactions with peers and others in the school community" (MacKay report on Inclusion in schools in New Brunswick, 2013 in Khanna and Kareem, 2021, p.2).

With regards to the definition of digital inclusion, Dilnutt (2018) underlines that many definitions exist. It seems to have in common three recurring themes. The first one is the access to digital services and devices. The second is literacy; meaning that people should possess the requisite digital and language skills as well as abilities (i.e., proficiencies and

understandings) to use digital tools. The third element is what he calls ‘enablement’; meaning that people are enabled to “use technology as a tool to access information and resultant improvements to quality of life” (Dilnutt, 2018, p.12).

Today, digital inclusion is nearly an indispensable condition to inclusive education. A fact that became even more evident throughout the rapid transition to online learning due to COVID-19. However, to avoid a situation of ‘emergency remote teaching’ in the future (Hodges et al., 2020), it is important to fully understand the specificities and prerequisites of online teaching. As Rapanta et al. (2021, p.927) framed the situation: “the emergency remote teaching required by Covid-19 has often been improvised rapidly, without guaranteed or appropriate infrastructural support”. The challenge is, thus, to adapt online education to improve inclusion, engagement, and motivation, as well as limit the technical issues. Thus, leaving no one behind.

The state of digital inclusiveness in Europe

As mentioned before, Dilnutt (2018) highlighted three main themes that characterize digital inclusion: access, literacy, and enablement. On the first element, around 91% of the people in Europe have internet access at home and 86% of citizens are internet users (European Commission, 2021). The main reasons for those who are still not connected are the lack of interest (45%), insufficient skills (45%), equipment costs (25%) and other cost barriers (23%). These barriers are a good general indicator although huge disparities exist between countries. For instance, the cost issue is a minor problem in Estonia (5% mentioned it as a barrier) whereas it seems to be a major problem in Portugal (53% mentioned it as a barrier).

The second component concerns digital literacy, which is an influential factor as 45% of the “offline” Europeans reported the lack of digital skills as the main barrier to getting online (European Commission, 2021). On a positive note, the European Commission in 2020 found that 58% of individuals have at least the basic digital skills. This percentage is even higher in younger age groups (16-24) and students, 82% and 87% respectively. However, although most of today’s students are digital natives, their use of digital technologies predominantly happens in social contexts but rarely within the professional or educational spheres. Gaebel et al. (2021) argue that this situation needs to be changed, “With a more systematic use of digital enhanced learning and teaching (DELT), this would have to be considered in curricula and learning outcomes” (p.25). In practice, universities and other HEIs rarely provide a fully embedded digital learning offering. Digital skills are learnt and treated at a very general level or within the framework of a specific course or programme. Moreover, these offerings which can improve students’ digital skills are sometimes available on a voluntary basis (Gaebel et al., 2021). In addition to digital skills, other important skills should be considered such as language skills. Interestingly, Dilnutt (2018, p.12) underlines this point in his study about MOOCs, saying that “Limitations in English proficiency inhibit digital inclusion particularly in underdeveloped geographies”. The third item, enablement, is more difficult to observe and is quite transversal. However, during the Covid-19, it seems that digital services and infrastructures suddenly received additional importance and value. In Gaebel et al. (2021) study, 90% of responding universities were already providing open online library access to their students. Still, 65% of them took actionable steps to further improve the availability of their online resources.

Beyond these functional themes and services linked to inclusivity in digital learning, other “social” factors have to be considered. As Gaebel et al. (2021, p. 33) mentioned “The lack of spaces for social interaction, the lack of peer exchange and peer support, that often results from casual meetings in corridors, cafes and parks on and around the campus has been identified as a major problem for students during the pandemic.” A meaningful understanding of the interlacing relationship between inclusive education, digital inclusion and social inclusiveness is important to be shared and enacted among the different stakeholders: educational institutions, government agencies, educators, and students. It is no better summarized than Dilnutt’s (2018, p. 12) comment on this connection as being the route “to access information and resultant improvements to quality of life” . Figure 1 lists and ranks some benefits of online learning and teaching according to Gaebel and colleagues’ (2021) study.

3. Findings

In this section, the results of the qualitative as well as of the quantitative phase will be presented. Findings of the qualitative phase will be included in the quantitative phase and further analysed. The conclusion of the analysis will be summarized in learnt lessons and best practice examples.

Qualitative findings

As mentioned before, data were collected through individual in-depth interviews and focus groups using an interview guide that was developed by the partners. The interview guide consisted of questions for both students and lecturers. These questions are presented in Table 1.

Table 1. Interview and focus groups questions

	Students	Lecturers
1	What motivates you to learn?	Have you experienced changes regarding the students' learning experience since the beginning of the pandemic (i.e., with the shift to online/ distance learning)? If so, what are your explanations for these changes and how did you adapt?
2	Have you experienced changes regarding your learning experience (motivation) since the beginning of the pandemic (i.e., with the shift to online/ distance learning?) If so, what are your explanations for these changes and how did you adapt?	Have you experienced any changes regarding different kinds of students (age, gender, background)?
3	What opportunities and challenges has this pandemic generated in terms of learning for you?	What has impacted the way you teach since the beginning of the pandemic? How did you adapt yourself?
4	What would you recommend as dos and don'ts for other learners?	What opportunities and challenges has this pandemic generated in terms of education for you?
5	What would you recommend as dos and don'ts for the university you are enrolled in?	Lessons learnt: What would you recommend as dos and don'ts for other lecturers/your university?
6		In your view, what are the biggest education challenges for the future?

Each project partner collected the data and submitted their own transcripts. The transcripts were sent to the Estonian partner (Tallinn University of Technology) in charge of the work package. To facilitate the analysis process, relevant information gathered from the interviews was assigned to several broad themes aimed at synthesizing the main messages received regarding the questions posed, thus taking advantage of the notion of thematic analysis. Table 2 lists the themes developed for each of the two groups.

Table 2. Themes derived from qualitative research stage

Themes Lecturers	Themes Students
Inclusiveness	Motivation
Engagement	Convenience
Personal and social	Personal and social
Pedagogy	Pedagogy
Technology	Technology

The following sections provide some synthesized findings of the themes listed in Table 2; it begins with findings from the lecturers.

Lecturers' findings

Inclusiveness in digital education

Some lecturers noticed that new students/ freshers struggled the most as they are not used to the university system yet and were expecting to start building their social life through the university. One lecturer from Estonia affirmed saying *"it's more challenging for the first-year students"*. Senior students were found to be more adaptable to the changes and apparently *"happier"* with the shift to online classes compared to younger ones, as they were able to find more time to work and earn money. One lecturer from Poland reported on this issue saying that *"The higher the year of studies, problems were less visible"*.

Also, some lecturers noticed that female students and locals became more activated in the online environment in comparison with their peers. For example, it has been reported by lecturers from Estonia that *"... online, girls are more active and Estonians"*, or that *"female students are more motivated and diligent in their studies"*, while a lecturer from Bulgaria remarked that *"we can communicate with local students better through digital channels because our language is the same"*. A few lecturers found that international students become withdrawn from the learning process as mentioned by two lecturers from Estonia commenting on the changes they noticed among student groups *"it is more challenging especially for the international students"* and *"foreign students tend to remain silent"*. Other lecturers noticed that the differences between students became more accentuated in terms of their academic performance and class engagement; a lecturer from France noticed a *"wider gap between the very good students who even got better results and the students in the most difficult situations that teachers were not able to get back to class"*.

Engagement with students

Several lecturers noted that the majority of students were demotivated and engaged less in the online environment compared to the classroom. On that issue, one lecturer in Bulgaria stated that *“education turned into a recipe book and lost its heart and soul”*. The lecturers described the students as being passive and absent and said that their attempts to activate the students in online classes were very difficult tasks. It was also reported that they just see names (on the videoconferencing software screens) with no faces as students prefer to turn their cameras off. As one lecturer from Estonia said: *“In the classroom, I know the faces, but I don’t know all the names. In Zoom, I can see the names, but I don’t know the faces behind them”*.

Personal and social challenges

The changes inflicted by the pandemic on higher education extended beyond the university borders and affected the personal lives of staff and students, as they worked in separation from their peers and the rest of the academic community. Feeling left behind and socially isolated, coupled with their inability to build connections was a major negative effect of distance learning. In addition, the physical and mental health of several lecturers has suffered due to the digital exhaustion and additional work duties which brought more stress. Regarding the latter, one lecturer from Estonia said they suffered from *“Increased work duration. Literally 24/7”*.

Pedagogy

A more experiential approach to teaching, which develops the practical skills of students was found to be more engaging and suitable for the online environment than a theory-driven approach. As a lecturer from Belgium mentioned: *“make the link between the courses and their practical application to motivate all the troops”*. However, lecturers’ inability to add notes and further explanations to the online slides in real-time based on their interaction with the students, could be a hindrance to a more practical approach to teaching. Lecturers noted that pedagogy needs to be redesigned for the online environment, as one from Bulgaria confirmed that *“The exact replication of traditional education in a virtual environment is wrong”*.

Recording lectures and making them available to students, either pre or post class, was seen as a major convenience factor for both parties: students and lecturers. However, a hybrid format of teaching was disparaged as remote students often felt left out of the learning process and lecturers’ focus on the classroom was affected by the parallel “virtual” group of audience. Also, the majority agreed that classroom education is irreplaceable, as summed up by a lecturer from France: *“Face-to-face teaching remains essential”*.

Exams and assessments were some of the main pedagogical challenges in e-learning, with reports on numerous incidents of plagiarism and cheating. In addition, lecturers viewed that traditional assessment methods of students’ performance cannot simply be copied to the online environment and need to be remodeled accordingly.

Technology and digital tools

The findings suggest that the online environment, aided by the multitude of available technologies and software allowed the trial of different tools and was an experiential learning opportunity for lecturers. A lecturer from Belgium went further in highlighting this opportunity saying: *“I see nothing positive arising out of this crisis, except the discovery of new teaching methods and tools”*, and another lecturer from Poland regarded it as *“a long overdue evolutionary step”*.

The interviews left us with the impression that the integration of digital communication tools in the learning process helped to improve connections between students and teachers, and among the students themselves. Some of the most beneficial features reported are the breakout rooms. Based on this, lecturers in Estonia said it *“went better than we expected”* and *“turned out to be a great idea”*. According to them, the use of breakout rooms facilitated online group work in a way similar to a physical classroom. Additionally, the use of the chat function helped establish a real-time communication channel between the lecturers and students for answering questions and discussing ideas, as iterated by a lecturer from France: *“chat function was helpful to explain things, ask questions and answer them”*. Also polls and quizzes were found useful to activate students, especially the silent, shy, and non-participating ones.

Several lecturers also stressed that they need to receive training to help them better use and apply technological tools in educational settings, and to improve their digital literacy in general. As expected, the variance in internet speed and availability, software and hardware performance indented lecturers’ ability to rely on them at all times. Something which affected the learning process, manifesting in the form of disruptions and communications issues.

Students’ findings

Motivation

It appears that most students are primarily driven in their learning endeavors by a desire to build a promising career, land a job or improve their salary. As framed by a student from Poland: *“we are motivated by money, a well-established life and a well remunerated job”*.

The majority of students, however, were demotivated with the shift to online learning. This demotivation extended and got worse with time, affecting their engagement and performance. A student from Bulgaria explained the situation saying: *“I have jumped into complete isolation from everything and everyone”*. Some students attributed part of this drop to lecturers being less considerate and supportive throughout the e-learning process. In this context one student from Bulgaria mentioned that *“some lecturers did not try their best compared to when we were face-to-face”*.

Convenience

The ability to work from anywhere, at any time and on multiple devices, together with being capable of working (earning money) and studying at the same time was viewed as an advantage by some students. A student from Bulgaria mentioned that he *“could combine a full-time job with education”*. Online education also allowed students to save money and time by staying with their families and not having to commute to the university daily. Another plus was the improved access to education and knowledge in general. Students were able to enroll

in programmes and courses located in other countries and earn degrees online remotely. As one student from Poland summed it up: *“It made our study options literally unlimited”*. However, some students had difficulties concentrating on their studies due to the distractions at home, as a student from Poland said, *“at home there are many things that can distract us”*. Also, the lack of supervision from lecturers and faculty, and limited peer support affected their ability to study at home.

Personal and social challenges

Depression and a growing sense of isolation were drastic consequences to the online shift, as reported by most students. A student from France mentioned that there was an *“absence of human relationships, the complete absence of individualization”*. The students’ inability to connect with their colleagues, either for course-related purposes or outside the educational context, was a major setback. As a student in Poland commented, *“our social life suffered a lot”*.

Pedagogy

In regard to the different teaching formats, the students involved were more vocal in expressing their dislike of hybrid teaching compared to lecturers. As mentioned by a student in Estonia: *“In hybrid mode, classroom students get better support and online students feel the teaching was not directed to them”*. A student in France was more adamant in rejecting it by saying: *“prohibit hybrid learning”*. As for online teaching in general, some students found that online lectures were rather shallow in comparison to the classroom. The former was perceived as unidirectional and resembling a slideshow, as phrased by a student from Bulgaria *“the online lectures were often more unilateral and monotonous”*. Other students demanded more practical and interactive classes with less focus on theory, while avoiding unnecessarily lengthy lectures.

Taking exams in an online environment was not favored by some students. These students reported issues related to mismatch between the exam length and duration, difficulty levels, and unfair assessment of their efforts. Many students reported that they suffered from an increased workload with online education. A student from Estonia, for instance, mentioned that there was *“too much that needs to be done”*. The increased workload was not perceived by some students to be matched with equal attention from their lecturers, who some found to be sometimes negligent and lacking empathetic consideration of their circumstances. The opportunities to interact with other students and industry in the form of group work for example *“became more difficult”* as well as mentioned by another student from Bulgaria. Also, conducting empirical studies, internships, and project-based work were seen as challenging in the online environment.

Technology and digital tools

As with the lecturers, the reliability of the internet and technological tools were major issues. One student from Belgium commented on the *“internet connections issues”* as being one of the major challenges. The situation was more acute among the students though as some of them could not afford buying quality hardware, software, or internet subscription. Also, the digital infrastructure in some universities was not up to the task with reported disruptions of university systems or malfunctioning of educational programmes. The majority of students

complained about the confusion caused by having to use several platforms in the learning process and switching between them: learning management system, videoconferencing, email, university systems, etc. A student from Estonia commented on this conundrum saying that *“it’s very difficult to understand all this software”*. Students also found some of those platforms, especially Moodle, to be less user-friendly and intuitive.

Next, the presentation of the quantitative findings follows.

Quantitative findings

Based on the analysis of the data gathered from the questionnaire, the subsequent subsections will expound on the results and provide insights on its different parts.

Demographics

A total of 2,994 responses across the six countries (i.e., Bulgaria, Belgium, France, Estonia, Poland, and Italy) were received from the survey. In order to handle missing data due to unavailable entries and incomplete responses of some questions, the listwise deletion method was used. As a result, 2,109 completed responses were obtained, consisting of 1,955 for students and 154 for lecturers.

Table 3, displayed on the next page, provides an overview of the demographics of both students and lecturers who participated in the survey. According to the results from the students' responses, 67% were females and 64% undergraduates, with 80% of the total students below the age of 24. Although just a fraction of the students was international, they were quite diverse in terms of their country of origin as illustrated by Figure 2. Similarly, for the lecturers' responses, almost two third were female lecturers. Although 61% of lecturers have been teaching for more than 10 years, only 5% have more than five years of online teaching experience.

Figure 2. Country of origin among the students



Table 3. Demographics of both students and lecturers

S t u d e n t s	Gender	%	L e c t u r e r s	Gender	%
	Male	32		Male	41
Female	67	Female	59		
Diverse	1	Age			
Age		20-24 years	3		
Under 20 years	42	25-34 years	16		
20-23 years	44	35-44 years	25		
24-26 years	9	45-54 years	35		
Above 26 years	5	55-64 years	16		
I am an/a		65 or more years	5		
Local students	92	Years of teaching experience			
International students	8	5 or less years	21		
Level of studying		6-10 years	18		
Undergraduate	64	11-19 years	23		
Graduate	29	20 or more years	38		
PhD	1	Online years of teaching experience			
Other (e.g., MBA)	6	1 year	49		
		2-5 years	46		
		More than 5 years	5		

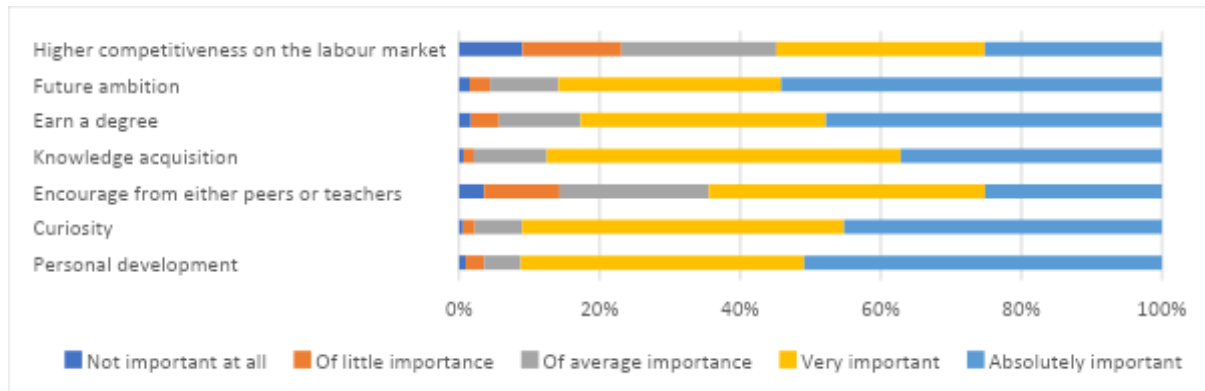
The coming sections report the findings with respect to students' motivation to learn, preferences of learning modes, perception of online teaching and assessment of their digital skills.

Students findings

Motivation to learn

Among the student respondents, 91% indicated that their personal development and curiosity serve as a motivating factor for them to learn. Also, 88% and 86% of the students reported that their interest in learning is driven by knowledge acquisition and future ambition respectively. It was also found that 23% of participating students perceive higher competitiveness in the labour market as of little or no importance when asked about factors that instigate their motivation to learn (see Figure 3).

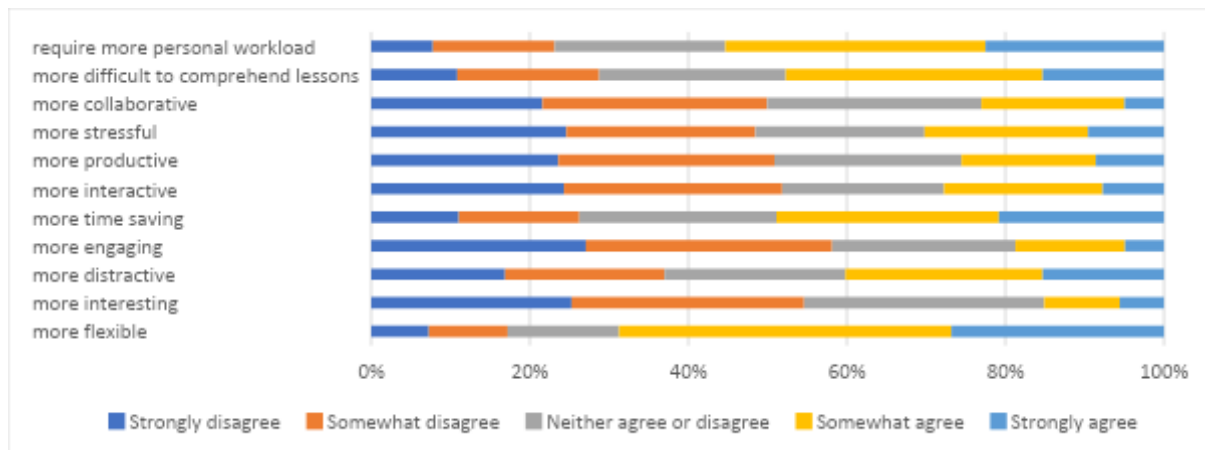
Figure 3. Motivation of students



Comparison between on-site and online classes

The students were also asked to make a comparison between on-site and online classes based on a number of pre-specified items (Figure 4). The results show that a significant part of the students, i.e., 69% consider online classes more flexible than onsite classes. 58% of the students also reported that online classes require more personal workload when compared with onsite classes. It was also found that more than half of the students disagree that online classes are more engaging and interesting than onsite classes. With regards to the item, “Compared with on-site classes, online classes are in my view: more distractive”, there is a balance between those students who agree (40%) and those who disagree (39%) on it. About 49% of the students view online classes to be more time saving, while half of them disagree that online classes are more interactive, productive, and collaborative than onsite classes. Moreover, a larger part of the students disagrees that online classes are more stressful than onsite classes. Lastly, 48% find it difficult to comprehend lessons through online classes.

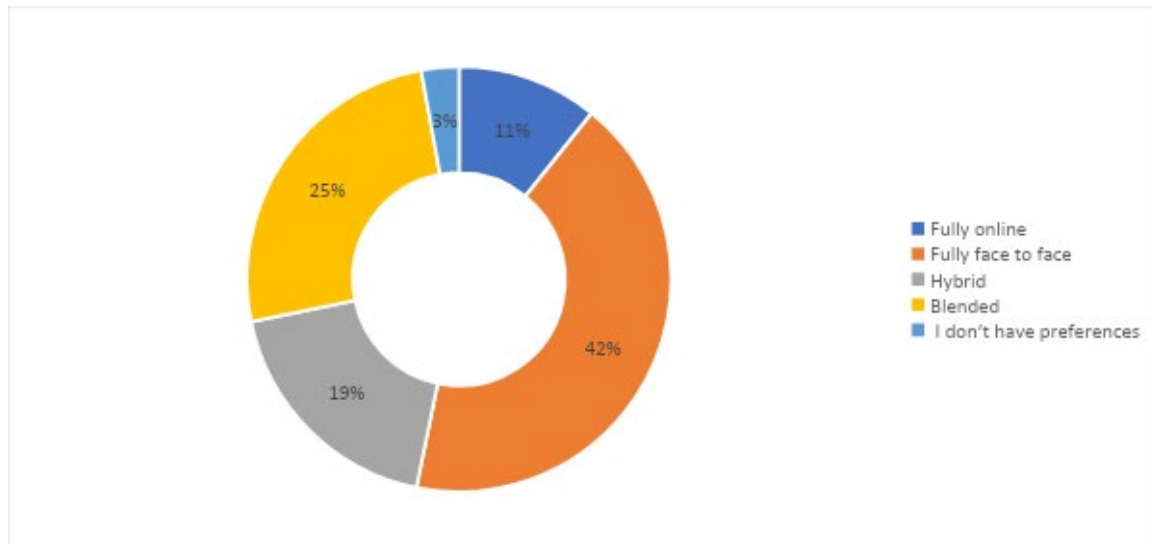
Figure 4. Students’ viewpoints on on-site vs. online classes



Most importantly for the aim of this report, students were asked to select their preferences among several learning modes which include fully online, full face-to-face, hybrid and blended (Figure 5). From the results, it is observed that a significant percentage, namely 42% prefer fully face-to-face as opposed to 11% who prefer fully online. There are also 25% of the students who prefer blended; that is, some parts of the class are delivered onsite while the

rest are delivered remotely, and 19% of the students reported to prefer hybrid; that is, some students are onsite while others join remotely online. The remaining students (3%) stated that they do not have any preferences as far as the mode of classes is concerned.

Figure 5. Students' preferences on the mode of classes

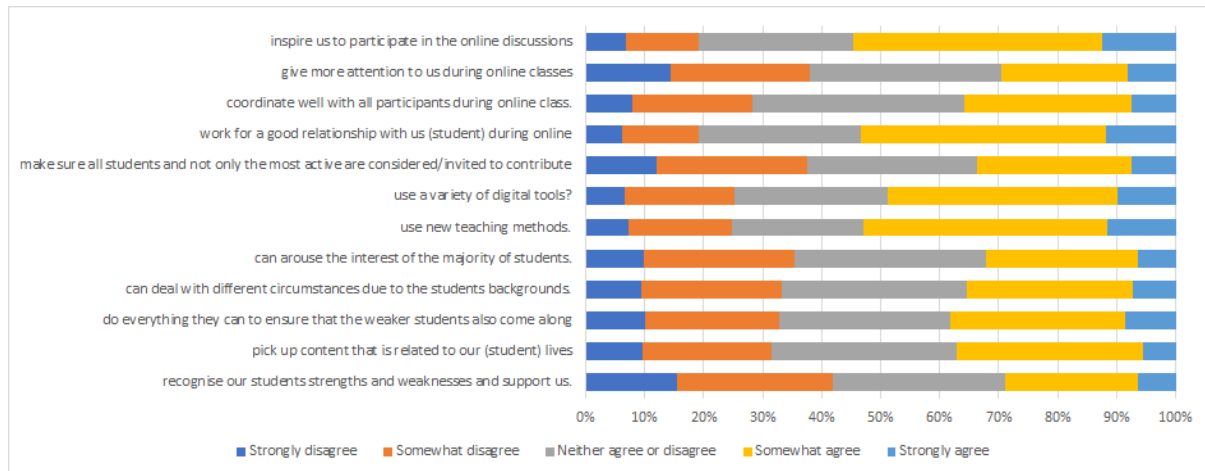


Perception of online teaching regarding inclusiveness

Regarding the students' perception of inclusive online teaching (Figure 6), 55% indicate that their lecturers inspire them to participate during discussions in online classes. Also, 53% of responses from students agree that their lecturers use new teaching methods, and work for a good relationship with them (students) during online classes. Almost half of the students also agree that their lecturers use a variety of digital tools in teaching. In addition, 36% of the students agree that their lecturers pick up content that is related to students' lives, and 37% reported that the lecturers also coordinate well with all participants during online classes.

However, 42% of the students disagree that the lecturers recognize their strengths and weaknesses, and support them during online classes. Furthermore, 38% of the students disagree that during online classes lecturers give more attention to them. Regarding whether the lecturers can deal with different circumstances due to the students' backgrounds, 32% of the students disagree. Similarly, 38% of the students disagree that their lecturers make sure all students and not only the most active ones are considered to contribute during online classes. In the same vein, 35% disagree that their lecturers can arouse the interest of the majority of students in online classes.

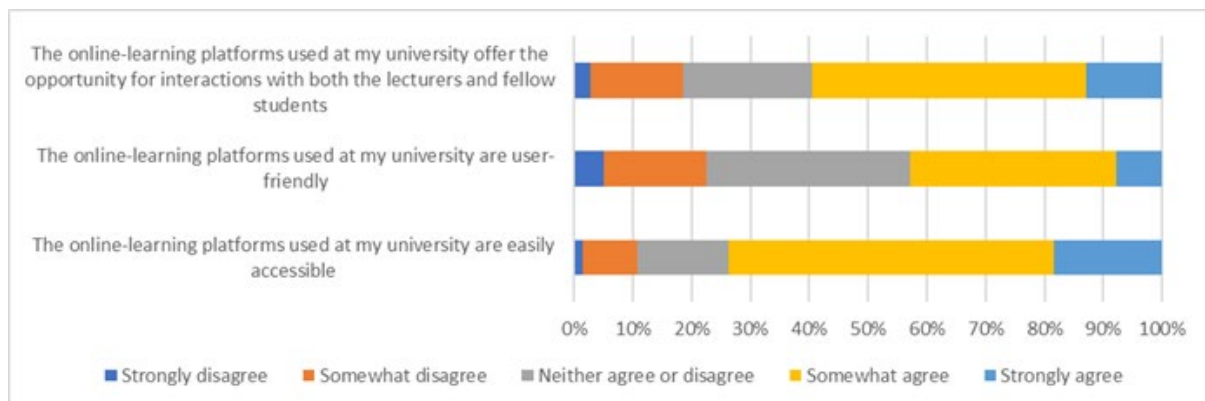
Figure 6. Students' perception of online teaching



Perception of digital skills and tools

In order to gather information about the students' perception of the digital tools provided by the university, a number of questions were asked as illustrated in Figure 7. From the results, a significant part of the respondents - 74% agree that the online-learning platforms used at their universities are easily accessible. Similarly, 59% agree that the online-learning platforms used at their universities offer the opportunity for interactions with both the lecturers and fellow students, while 22% disagree that the online-learning platforms used at their universities are user-friendly.

Figure 7. Students' perception about digital tools provided by the university



The next section turns to findings relating to questions that focused on diversity and cultural differences in conjunction with digital education and the personal challenges that emerged during online teaching, from the lecturers' perspective.

Lecturers' findings

Diversity and cultural differences

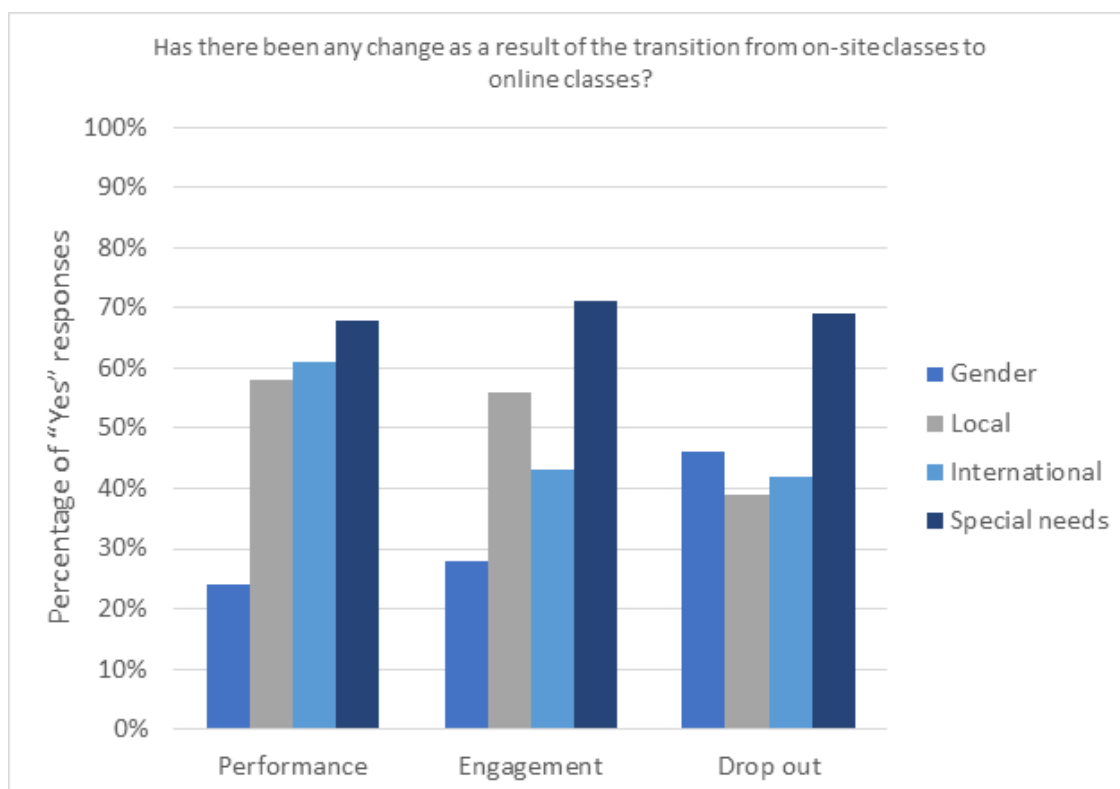
To better understand how the switch to digital education influenced different types of students, the survey focused on three key indicators: academic performance, engagement, and withdrawal/drop out from courses across gender groups, local and international students, and students with special needs. According to the results, less than 50% of the responses from the lecturers suggest that there is a significant change in academic

performance, engagement, and withdrawal from courses among gender groups as a result of the transition from onsite classes to online classes (Figure 8).

On the other hand, 58% of the lecturers reported that there is a change in the general academic performance of local students. According to their comments, local students' academic performance was relatively lower than the performance in previous semesters. For example, a lecturer from France expressed that *"the results in 2020-2021 were weaker than those previously recorded but from there, to say that it was caused by the transition to online courses is a line I won't cross"*. It was also observed that *"due to enhanced cheating possibilities ... students achieved much better grades"* in a particular class of only local students (A lecturer from Estonia).

In a similar vein, 56% of the lecturers stated a change in engagement among local students. Based on the explanations provided by some lecturers, fewer interactions were observed in both tutorials and normal classes held online. However, it was reported that there was a greater dialogue via mail/text message with a lower level of formality with local students. A lecturer from France emphasized, *"there is often no real interaction except through chat"*. In the case of possible withdrawals of local students from courses, the lecturers did not observe significant changes.

Figure 8. Lecturers' perception about consequences of digital education regarding various aspects



For international students, it was found that there is no change with regards to their engagement or withdrawal from/drop-out of courses. However, a significant change was observed in their academic performance as supported by 61% of "Yes" responses from the lecturers. From their comments, the academic performance of international students was not as good as they were last year, especially first-year students. As a general rule international

students are likely to experience academic difficulties in the process of adapting to a new culture especially at the beginning. Language barriers and complications in communication with their lecturers may also result in poor academic performance, issues that are more likely among first-year international students. Considering the challenges that international students encounter compared to local students and complementing the mentioned challenges with the intricacy of online learning and teaching make the situation, i.e., decreased academic performance, even worse. Therefore, the reported poorer grades from international students as a consequence of digital education is not really surprising.

Lastly, the results indicate that students with special needs also experienced a significant change in their academic performance, engagement during online classes, and withdrawal/drop out of courses as shown in Figure 8. Drawing on a lecturer's comments from Italy, improvements were observed among students with special needs as a result of the use of technological teaching and learning aids. The use of headsets and microphones enabled these students to better understand and express themselves, which in turn improved their engagement in online classes. Aside from that, there were also frequent withdrawals from courses as a result of the *"difficulty in adding an additional computer dimension to their initial disabilities"*, as expressed by a lecturer from France.

Perceived personal challenges in digital teaching

This section presents some personal challenges that the lecturers involved encountered as a consequence of switching to digital teaching. More precisely, insight into the lecturers' assessment of different types of stress and motivation regarding online teaching are addressed.

Stress assessment - Technological stress

According to the results, 30% of the lecturers agree with the statement *"I feel stressed to adapt myself to technology-enhanced teaching"*. Also, 15% find it difficult with their current skills to constantly improve their teaching through technology. Similarly, 19% feel stressed by the high technological requirements that are necessary for technology-enhanced teaching. Lastly, 26% agree that they are under pressure to change their students' guidance habits to meet current technology-enhanced teaching requirements.

Stress assessment - Burn out

About 43% of the lecturers agree that they feel exhausted from technology-enhanced teaching, and 38% point out that there are days when they feel tired before they start teaching from a distance. Similarly, 36% agree that after online teaching they need more time than in the past to relax and feel better, and 31% agree with the statement *"It happens more and more often to talk about my online teaching, in a negative way"*.

Motivation regarding online teaching in general

Nearly a quarter of lecturers (22%) agree that they teach online because they like to do that, and 19% agree that they teach online because it gives them the opportunity to identify new aspects of teaching. The results suggest that motivation to teach online is generally low.

Recap/Highlights

As highlights of the above-mentioned, the following can be stated:

- Even though online education gives more flexibility, more than 40% of students prefer face-to-face teaching.
- Academic performance has decreased among local and international students as well as students with special needs. No differences were found among the genders.
- No noticeable changes regarding the inclusiveness of students from various backgrounds were found, yet some distancing of foreign students was reported while female students and students with special needs became more activated and empowered.
- The negative impact of the online shift in terms of isolation and lack of social life, was more noticeable and profound with first year students, and the less active ones.
- The motivation and commitment of the students gradually decreased with the duration of online-only education.
- A not insignificant number of lecturers reported stress from digital teaching; digital exhaustion and work overload increases.
- The majority of lecturers prefer other forms of teaching than online teaching.
- A need for developing the lecturers' digital skills and competences was found as well.

In the next section, the aim is to present and discuss the outcome of a cluster analysis conducted to derive more specific recommendations regarding inclusive digital education and thus to come closer to the development of the "Reference framework for inclusive digital education".

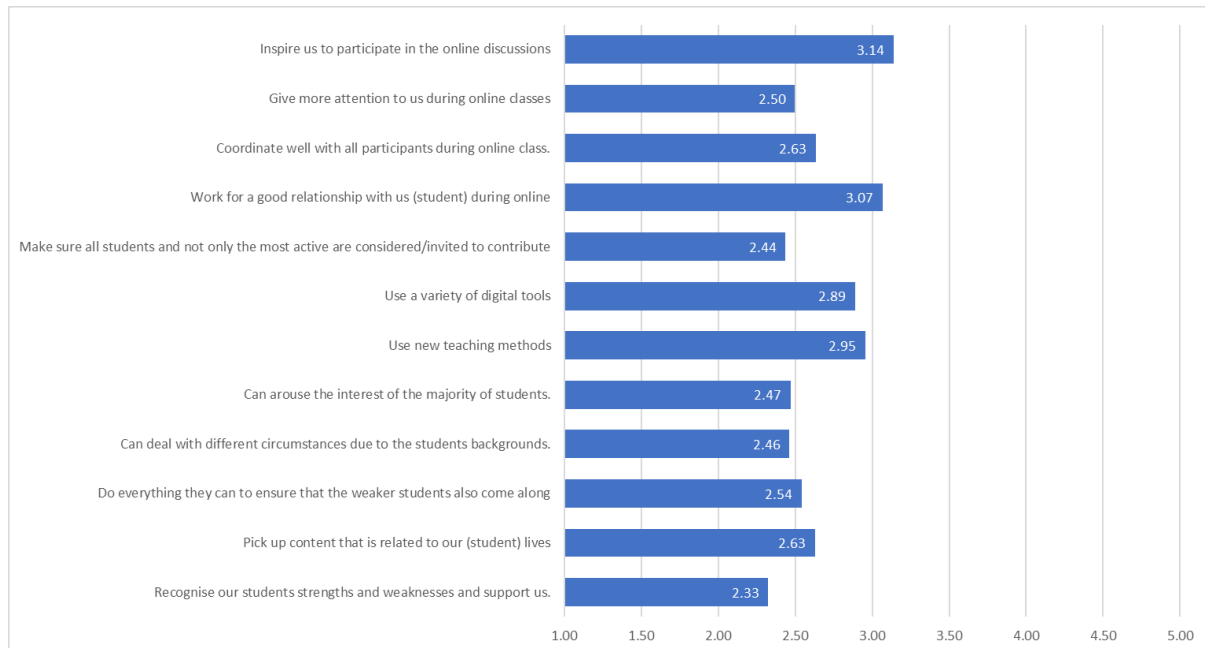
4. Findings of Cluster Analysis

In this section the findings of a cluster analysis are presented. It was conducted in order to identify discrete groups of students which, in turn, can facilitate the derivation of more specific recommendations and a multi group comparison of findings. The analysis indicated the existence of four clusters, i.e., the unmotivated student, the inactive student, the digitally activated student, and the mature student, which are presented in the following sections.

Cluster 1 - The unmotivated student

The total number of students in this cluster is 615 and the majority of them are between the ages of 20 and 23. Students in this cluster are mainly working on a part-time basis (< 10 hours per week), and they are also local students. It is observed that students in this cluster are not inspired to participate in online discussions. This suggests that some students, especially the female local ones, were not motivated during online classes, which is in line with one of the qualitative findings. Moreover, it is noted that there is a lack of cordial relationship between the lecturers and this group of students within this cluster. In effect, this could decrease the level of engagement that exists between lecturers and their students during online classes when compared with onsite classes. A similar conclusion was derived from the qualitative findings.

Figure 9. Mean values of relevant variables of cluster 1 “The unmotivated student”

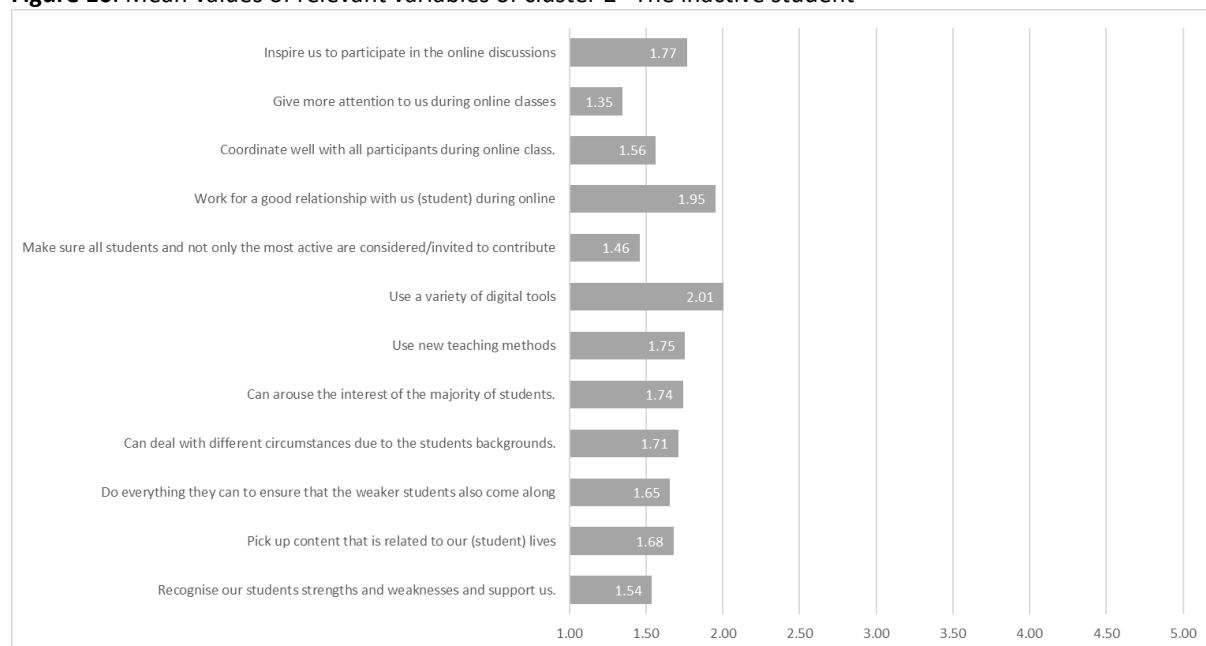


Cluster 2 - The inactive student

Out of a total of 1,955 students, 162 students were allocated to this cluster. This cluster is the smallest of all the clusters. While a few of the students are international students, the majority of the students are undergraduates of which half are not working.

In this cluster, the students indicated that much attention was received from their lecturers during online classes. However, the attention was more specific to the only active students leaving the less active students behind. Since the findings above provide new insights as far as inclusive digital education is concerned, especially to less active students, the findings will serve as complementary findings to the findings from the qualitative analysis.

Figure 10. Mean values of relevant variables of cluster 2 “The inactive student”

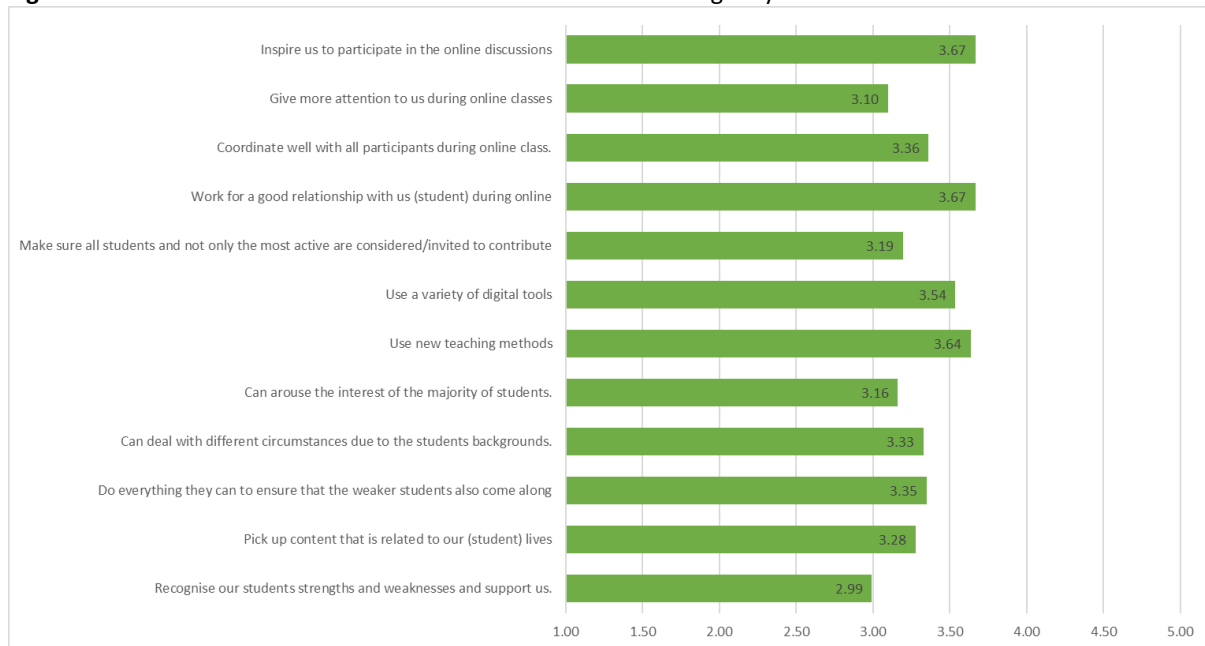


Cluster 3 - The digitally activated student

This cluster emerged as the largest in terms of cluster size. It has a total number of 747 students. The majority of the students in this cluster are not working and below the age of 24. Compared with the other clusters, this one primarily involves local undergraduate students who are of the view that online classes motivated them to participate actively in discussions.

These students also agree that the online classes provided opportunities for their lecturers to try new teaching methods, which in turn, improved their engagement. In other words, these students were exposed to a variety of digital tools in learning. This situation could have put more stress on these students in their quest to learn how to use or adapt to these new technologies. The engagement findings are in line with the qualitative findings as presented in section 3. It is worth mentioning as it highlights the perceived differences in terms of the level of engagement between lecturers and students.

Figure 11. Mean values of relevant variables of cluster 3 : “The digitally activated student”



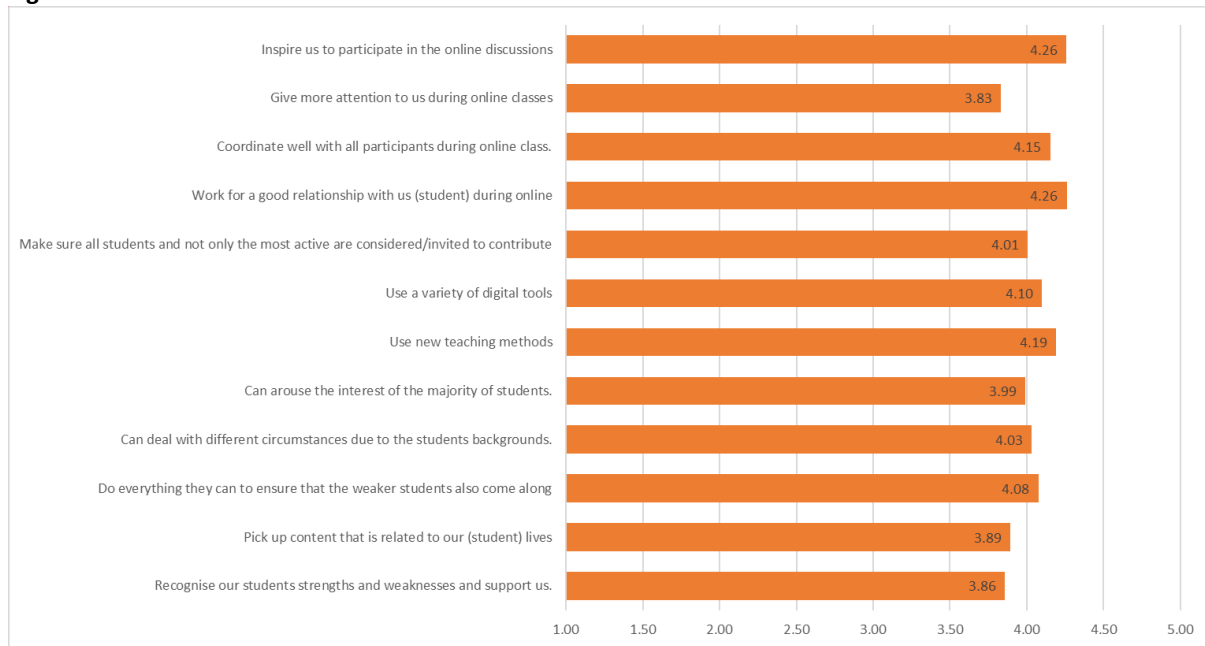
Cluster 4 - The mature student

The total number of students in this cluster is 300. It is also worth noting that a large number of the students are graduates of which almost all of them are working either part-time or full-time. More than half of the students in this cluster are above 24 years of age.

With regards to the composition of this cluster, it could be inferred that the majority are mature students in terms of their age and level of study. It appears these students generally consider online classes to be more satisfactory in terms of relatedness of content delivery to their personal lives, which is in sync with the findings from the qualitative analysis. Also, there are other dominating characteristics among these students such as high level of inspiration to participate in online discussion and better relationship with their lecturers. These students seem to be interested in developing and maintaining good relationships with their fellow students. With these characteristics, there is a possibility of better engagement between these students and their lecturers.



Figure 12. Mean values of relevant variables of cluster 4 “The mature student”

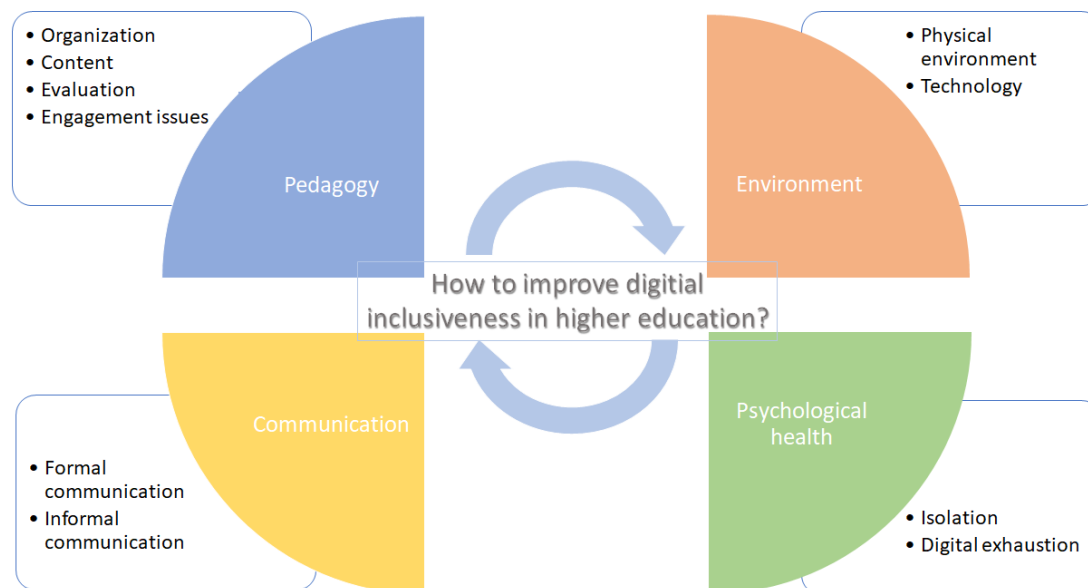


5. Lessons learnt and best practices

To come up with the lessons learnt and devise best practices for inclusive digital education, we relied on the findings from our research and complemented it with the experiences of the project group. There were more than professionals active in HEI who were directly involved in research including professors, lecturers, educational designers, project managers, researchers, and educational consultants. This diversity and wealth of experience allowed us to identify what worked and what did not in online education.

Below, we highlight the lessons learnt and the best practices to address each of them. We have organized them into four separate categories summarized in Figure 13. Each category contains two parts. The first part is the generic lessons learnt and the best practices to address them. These are followed by a short narrative to explain our observations and ideas behind the best practices provided. These observations encompass the perceptions of the lecturers and the learners as well.

Fig 13. Lessons learnt and Best practices for inclusive digital education categories



Pedagogy

These lessons learnt and the resulting best practices are mainly focused on the emergency practices that staff members and lecturers had to implement in response to Covid-19, as they were only able to make some adaptations to existing pedagogies but not a complete redesign of the teaching process. In the digital era, online education is a mixture of content, technology and humanized experiences (Fawns, 2019). According to Bates (2019), a good quality design of modern educational courses and programmes is associated with “clear learning objectives, carefully structured content, controlled workloads for faculty and students, integrated media, relevant student activities, and assessment strongly tied to desired learning outcomes” (p. 167).

Concerning the last sub-section (engagement issues), although pedagogical elements can impact engagement, there are other factors which influence students' engagement such as study environment, motivational and mental status, and communication challenges. Table 4 summarizes lessons learnt and best practices regarding the category "pedagogy".

Table 4. Lessons Learnt and Best Practices - Pedagogy

Subcategory	Lessons learnt	Best practices
Organization	Online classes are more flexible and convenient (but harder).	Use the opportunity to develop online courses or classes whenever applicable
	Face to face and blended are the preferred mode of classes	Avoid full online programmes
	The organization of the classes schedule, the courses' structure, learning objectives, assessment methods etc., were not clear	Define clearly in advance all the organizational aspects related to a specific course or a specific programme
Content	Content and material (e.g., presentations) are not adapted to online learning	Design the course with an online first approach and avoid transferring offline contents to online - without adaptation
	Recorded lessons are appreciated because of their convenience	Record lessons in real time or in advance whenever possible, and make them available to your students
	Evaluation	Grades are higher than usual, essentially because of cheating
		Establish a regular evaluation approach, e.g., weekly assignments
		Support students by giving them clear personal feedback, access to mock exams, exams from previous years, and instructions on how the evaluation will be done
Engagement	Higher absenteeism, lack of interactions and difficulties in keeping students motivated and onboard	Establish a regular coursework and evaluation points to keep students engaged and "in the now"
		Use interactive methods and tools such as visualization instruments and gamification principles to stimulate discussions and questions
		Reduce the size of groups to increase concentration and interaction
		Give sufficient breaks by taking regular pauses
	Online teaching is perceived as a constraint	Raise lecturers' awareness on the pros and cons of online teaching and train them accordingly

Environment

The environment in which students and lecturers learn/teach is not always appropriate resulting in several issues such as distractions, lack of concentration, incapacity to follow/give the lesson, etc. For some students, they may even have to share the IT device with other family members. Some lecturers as well might not have access to a calm room devoted to teaching activities. Moreover, for those who are parents, they also have to take care of their children at the same time.

When it comes to technology, higher education institutions' IT strategies have to consider three elements. First, the maintenance and renewing of hardware and software. Second, they have to consider the requirements needed to develop new teaching methods and digital learning environments such as interactive boards and communication apps. Third, institutions and more broadly public authorities must keep in mind the tech affordability for students. Results have shown that many students do not have any or adequate personal computers and use mobile phones to follow their course. Others might not have the ability to upgrade their internet connection for a seamless learning experience.

In addition, it is necessary to train all actors, especially staff members and lecturers in order to upgrade their digital skills and make them more comfortable in using tools available, thus improving the quality of the learning process. Thus, a systematic approach is necessary for institutions to develop digital skills and IT mastery for all actors. Table 5 displays lessons learnt and best practices regarding the “environment” category.

Table 5. Lessons Learnt and Best Practices - Environment

Subcategory	Lessons learnt	Best practices
Physical	Inappropriate work/ study environment (physical)	Invest in appropriate infrastructure to create suitable work/ study spaces for lecturers/ students
Technology	Institution's technological capabilities is not good enough	Invest in improving your IT infrastructure to support your lecturers and students better
	Actors have difficulties mastering different technologies (tools and services)	Invest in training for all actors involved (students, lecturer and academic staff) and provide sufficient support in terms of staff capacity, Q&A, tools, etc.
		Try to standardize tools and platforms used by the institution among department and faculties

Communication

Interaction is essential to maintain the link between people. This can take the form of either formal or information communication within an educational context, but both are essential to keep all actors engaged and activated. Table 6 summarizes lessons learnt and best practices regarding the “communication” category.

Table 6. Lessons Learnt and Best Practices - Communication

Subcategory	Lessons learnt	Best practices
Formal communication	Institutional and pedagogical information were not always clear or were not communicated in due time	Improve the overall formal communication by defining in advance messages and the dissemination channels to be used
		Unify and centralize as much as possible the diffusion channels
		Improve the coordination in communicated messages to avoid contradictory or redundant information
Informal communication	Feeling of loneliness and miss/ lack of communication and empathy from lecturers	Engage in small talk with students about non-academic topics

Psychological health

Digital exhaustion and isolation have been amplified due to Covid-19. This was felt more among new joiners and fresher students as they had to adapt to a new environment and new colleagues/students. Although Trope and Liberman (2010) underline the importance of “telepresence in digital technologies” to reduce the perceptions of social and psychological distancing, this is not a substitute to physical gatherings (Kirk and Rifkin, 2020). The same authors also highlight that these kinds of virtual events or calls bring their own stresses as well, when everyone assumes that being “available” or “online” in digital platforms means that you are ready to meet or work. Table 7 shows the lessons learnt and best practices regarding the “psychological health” category.

Table 7. Lessons Learnt and Best Practices – Psychological health

Subcategory	Lessons learnt	Best practices
Isolation	Lecturers and students as well as academic staff suffered from isolation	Create informal events and activities to reconnect people together, both online and physical
Digital exhaustion	Lecturers and students as well as academic staff suffer from digital exhaustion	

6. Recommendations

Based on the findings presented above, a number of recommendations are proposed so that HEIs are in a better position to deliver inclusive digital education that fits both students and lecturers.

Overall, the findings underline that there is a clear link between inclusiveness and social relationships. Given that building relationships is time-consuming, it is not surprising that older students report better relationships with faculty and fellow students. Building relationships is already difficult in an offline environment, in a digital environment this difficulty is exacerbated. However, to address the challenge, it appears advisable to draw on existing knowledge from research on virtual teams. Translated, this could mean that the following should be considered with regard to inclusive digital education:

- Technology
 - Key is to not let technology drive digital education, it should rather support the learning journey and the people involved, i.e., students and lecturers.
 - Technologies should be selected and used that have demonstrated high rates of user adoption.
- The power of face-to-face experience
 - It is well-known that it is much easier for people to work together if they have initially met face-to-face. This also applies to learning together.
 - Face-to-face contact helps people not only to develop relational skills but also apply them which, in turn, creates expectations for using them also in a digital learning environment.
 - Taking advantage of “virtual handshakes”, that is to provide the opportunity for the exchange of some basic personal information.
- Pedagogy in an inclusive online environment
 - The use of rituals and symbols to develop collective identification and shared understanding.
 - Formation of smaller groups/classes to facilitate relationship building in digital education.
 - The teaching content and methods need to be developed, tried and tested specifically for online environments.
 - Individual monologues should be avoided by inviting interaction and input from others; this requires increased discipline (or especially) from lecturers.

The different types of students, as suggested by the cluster analysis, show that a "one-size-fits-all" approach is not applicable. Instead, the different types also require different approaches to inclusiveness. Based on the results, students in cluster 4 “*The mature student*” seem to be the easiest when it comes to developing and implementing more inclusive digital education. Compared to the other clusters, these students are more active and obviously willing to contribute to learning (their own learning but also collaborative learning). A suggestion could be to actively involve these students in the onboarding of younger students as well as international students as joint communication should be easier.

Inclusive digital education also requires the development of new competences and skills to better address the new and different challenges. These competences and skills should be developed by all staff dealing with students at the university, which means that the need for further training goes far beyond that of teachers. Relevant skills required for inclusive digital education appear to be:

- Cross-cultural skills: Staff (lecturers in particular) must be able to communicate about relevant matters with students from diverse cultural and ethical backgrounds.
- Interpersonal skills: Lecturers must be able to understand the needs, values and expectations of students, influence them, resolve conflicts, and build cohesiveness.
- Advanced digital skills: Lecturers must understand the pros and cons of different interactive digital education tools so that digital teaching can be optimally supported. Students must have advanced digital skills so that they too can use the tool properly for their own learning as well as learning with others.

To increase the likely success of the recommendations specified, it also emphasized to work closely with the international office as the people do not only know who is coming and from where, but they also need to be aware of the measures in the different schools/departments regarding inclusive digital education and its possible consequences for the incoming students. Vice versa the schools/departments benefit from the international office regarding their knowledge and understanding of inclusive digital education at other universities, including the expectations and needs of the incoming students.

7. Conclusion

The COVID-19 crisis forced Higher Education Institutions to move their courses online rapidly. Although some universities have been delivering parts of their study programmes and courses online for years, the situation was far from optimal for the majority of them. Most of the universities were not ready for the transition triggered by the pandemic, which, in turn, affected the adoption process for both lecturers and students, especially the vulnerable ones and those with less-than-ideal backgrounds and circumstances. For this reason, the IDEA project is centred on the concept of inclusiveness in digital education within the context of higher education institutions and aims to support the transition towards a more inclusive digital education

Based on data collected through different types of interviews and a large-scale survey conducted in IDEA project's partner countries (Belgium, Bulgaria, Estonia, France, Italy, and Poland) in-depth insights into digital education and more precisely inclusive digital education were gained. The findings, in the form of lessons learnt and best practices were synthesized and used to produce a "Reference framework for inclusive digital education".

In conclusion, digital readiness in education is unavoidable especially after the COVID-19 outbreak. This report highlights a number of critical facts HEIs must undergo to increase their digital readiness level to make the best of the opportunities provided by digital transformation while mitigating the challenges it introduces. The deliberate adoption and use of digital education tools should support HEIs to innovate and invigorate their theories and practices of pedagogy; a means to an end rather than the core component of the educational proposition. As the findings have shown in order to improve digital education, that is, to make it more inclusive, the persons responsible for continuous development of teaching at HEIs have to understand that face to face learning environments remain essential for creating and facilitating social interactions and experiences. A face to face learning environment also facilitates the practical application of acquired knowledge together in a group of students. Thus, a student gets the opportunity to learn with and from others while applying the knowledge which, in turn, can positively contribute to better learning outcomes. The conscious use of online teaching formats enables the transfer of theoretical knowledge that students need to successfully complete their studies. This will help HEIs to provide the level of support expected by their staff, lecturers, and students, regardless of their background or individual circumstances, to deliver quality education.

In sum, inclusive digital learning requires not only a deeper understanding of the advantages and disadvantages of different teaching methods but also a solid knowledge of the implications of using them for different students.

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Appendix

Appendix 1. Characteristics of cluster based on mean and standard deviation

Characteristics	Cluster 1 - The unmotivated student		Cluster 2 - The inactive student		Cluster 3 - The digitally activated student		Cluster 4 - The mature student	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
	n = 615		n = 162		n = 747		n = 300	
Recognise our students' strengths and weaknesses and support us.	2.33	1.01	1.54	0.67	2.99	0.97	3.86	0.99
Pick up content that is related to our (student) lives	2.63	0.96	1.68	0.82	3.28	0.85	3.89	0.83
Do everything they can to ensure that the weaker students also come along	2.54	0.96	1.65	0.83	3.35	0.85	4.08	0.91
Can deal with different circumstances due to the students' backgrounds.	2.46	0.89	1.71	0.90	3.33	0.79	4.03	0.88
Can arouse the interest of the majority of students.	2.47	0.89	1.74	0.86	3.16	0.87	3.99	0.82
Use new teaching methods	2.95	1.04	1.75	0.90	3.64	0.82	4.19	0.74
Use a variety of digital tools	2.89	1.00	2.01	1.05	3.54	0.83	4.10	0.83
Make sure all students and not only the most active are considered/invited to contribute	2.44	0.92	1.46	0.68	3.19	0.91	4.01	0.87
Work for a good relationship with us (student) during online	3.07	0.97	1.95	1.04	3.67	0.74	4.26	0.74
Coordinate well with all participants during online class.	2.63	0.85	1.56	0.69	3.36	0.75	4.15	0.79
Give more attention to us during online classes	2.50	1.04	1.35	0.60	3.10	0.94	3.83	0.95
Inspire us to participate in the online discussions	3.14	1.00	1.77	0.95	3.67	0.77	4.26	0.75
Gender	1.70	0.48	1.77	0.42	1.69	0.49	1.67	0.50
Age	1.80	0.79	1.71	0.69	1.52	0.63	2.41	0.92
I am a(n) local or international student	1.10	0.34	1.09	0.35	1.06	0.28	1.15	0.41
Level of studying	1.49	0.73	1.37	0.53	1.39	0.78	1.63	0.81

Work hours	1.79	1.18	1.43	0.80	1.19	0.48	2.53	1.56
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Appendix 2. Examples of best practices applied by partners

Best practice category	Examples of best practices applied by partners
Pedagogy	<ul style="list-style-type: none"> - Invite guest speakers - Add more value to the students by giving them more borderless insights - Engaging in open discussions about the changing role of universities (universities no longer have a monopoly over knowledge creation and dissemination) - Provide lesson plans - Remind regularly about upcoming events and activities - "Café pédagogique": a place for information, training, exchange of experiences and best practices in teaching and technology - Make an online code of conduct for faculty members and students - Coordinate all activities, events and deadlines through a central calendar - Use in class quizzes, breakout rooms and chatting - Use interactive teaching methods (role-playing, collaborative tools, etc.) - Split sessions with a precise objective, easier with students who already know each other - Use a visual aid to capture the gaze and attention of students. - Use screen sharing tools - Give the lesson before; students can work on it and discuss during the lesson - "Innovation Day": a day of exchange and highlighting of innovative teaching projects within the faculty - "Teaching Award": competition to reward innovative teaching projects - Record lessons - Use in class quizzes, breakout rooms and chatting - Non academic talk with students; help break the ice, reduce tensions & stress, and motivate students - Use a visual aid to capture the gaze and attention of students. - Use screen sharing tools - Give the lesson before; students can work on it and discuss during the lesson - Use interactive teaching methods (role-playing, collaborative tools, etc.) - Split sessions with a precise objective, easier with students who already know each other - Give teachers time to learn how to use more agile, easier and simpler tools to use - "Teaching Award": competition to reward innovative teaching projects
Environment	<ul style="list-style-type: none"> - Give teachers time to learn how to use more agile, easier and simpler tools to use - Ensure that the student "user" experience is user-friendly and creates a sense of belonging
Communication	<ul style="list-style-type: none"> - Remind regularly about upcoming events and activities - Make an online code of conduct for faculty members and students - Coordinate all activities, events and deadlines through a central calendar - Non academic talk with students; help break the ice, reduce tensions & stress, and motivate students



Psychological health	<ul style="list-style-type: none"> - Non academic talk with students; help break the ice, reduce tensions & stress, and motivate students - Welcome of newly hired teachers, customized support for teachers and assistants - Ensure that the student "user" experience is user-friendly and creates a sense of belonging
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