VRTEACHER

Virtual Reality-based Training to improvE digitAl Competences of teaHERs

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Authors:	Mariano Sanz & Isabel Álvarez
Contributor:	Kalliopi Evangelia Stavroulia
Editor:	Fundación Siglo22

Distribution List for revision

Organisation		Person
Cyprus University of Technology	**CUT** Cyprus University of Technology	Kalliopi Evangelia Stavroulia Andreas Lanitis
UNIVERSITY OF THE AEGEAN	**UAEGEAN** Panepistimio Aigaiou	Costas Tsolakidis Nancy Pyrini
Fundación Siglo22	**SIGLO22** Fundación Siglo22	Mariano Sanz Prieto Isabel Álvarez Testillano
fip Future In Perspective	**FIPL** Future In Perspective Limited	Sarah Keegan
uc3m Universidad Carlos III de Madrid	**UC3M** Universidad Carlos III de Madrid	Paloma Díaz Telmo Zarraonandia
3CL FOUNDATION	**3CL** The Commonwealth Centre For Connected Learning Foundation	Martin Debattista Klaudia Farkas

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1. VRTEACHER Project

The COVID-19 pandemic had a huge impact on how education and training were delivered. It also highlighted the urgent need to adopt innovative and technology-based pedagogical approaches in teaching and learning, as well as the importance of empowering educators' digital skills.

Pandemic situations like COVID-19 can cause deep learning crisis with disastrous consequences, not only for future generations but also for society. For that reason, immediate action is required, contributing to the adoption of modern, technology-based support tools that could help educators improve their skills and expertise. The VRTEACHER project has as its main objective to promote the implementation of modern and novel technology-based Virtual Reality (VR) tools that could enhance the personal and professional development of educators, while at the same time fostering the digital transformation of education and the development of novel digital resources. Additionally, the project aims to encourage the sharing of best practices to ensure the delivery of high-quality learning in times of crisis.

The VRTEACHER project aims to provide successful educator training solutions through the use of a revolutionary VR-based educational technique for virtual practicum. The project's goal is to use a Virtual Reality (VR) training methodology and tool to address the demand for modernization and digital transformation of teacher education and training, as well as to reinforce educators' digital skills and preparation.

The partners involved in this project are the following:

- Cyprus University of Technology (Cyprus) – Coordinator
- Panepistimio Aigaiou (Greece)
- Fundación Siglo22 (Spain)
- Future In Perspective Limited (Ireland)
- Universidad Carlos III de Madrid (Spain)
- The Commonwealth Centre For Connected Learning Foundation (Malta)

The project's innovation lies in addressing challenges related to classroom management in crisis situations, such as a pandemic, with the goal of equipping teachers with key skills (including empathy, perspective-taking, self-efficacy, adaptability, etc.) through immersive and experiential training experiences that reflect real-life scenarios and situations encountered during a crisis.

To design the different scenarios that will provide real help in this educational training, the project proposes to analyze in-depth the situation experienced in schools during the pandemic. To this end, this project result includes an analysis of teachers' needs and demands during the COVID-19 pandemic, which will serve as the foundation for the construction of the

project's pedagogical and competence framework for the VR-based training approaches. The construction of the pedagogical and competence VR training framework is a combination of the core competences for class management in response to the COVID-19 pandemic that were identified through a survey and the ability to target those competences through VR training. This will enable the creation of successful training scenarios that address key life competences that may be nurtured through VR-based approaches.

2. Methodology

The VRTEACHER project partners carried out several actions to create the basis for the development of the projects' pedagogical and competence framework. The definition of the methodological framework of the project was based on a 3-step process as described in figure 1. At first, the partnership conducted an extensive review of existing competence frameworks for teachers. Then a survey took place aiming to identify teachers' needs and key skills in the post covid era. Based on steps one and two, focus groups have been conducted with expert educators, higher university students, and researchers to investigate in more depth teachers' needs and expectations and how they can be addressed using novel VR training tools.

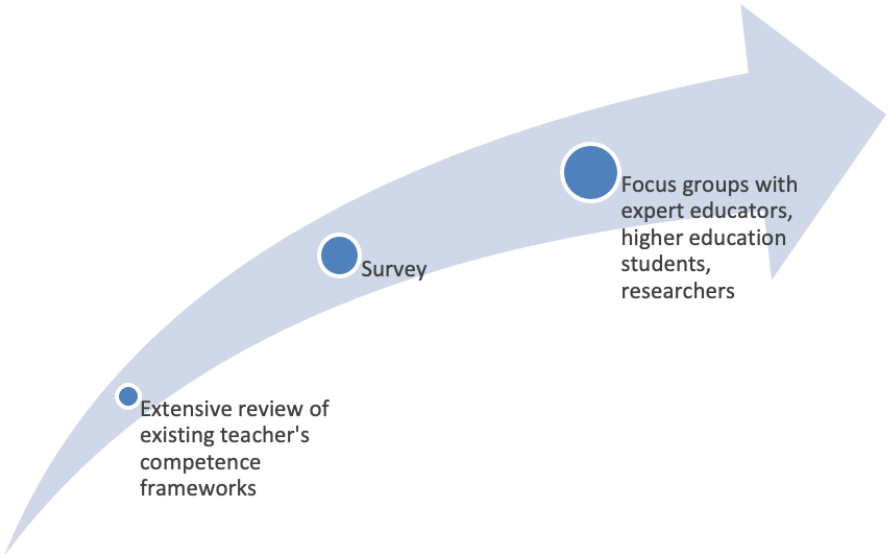

Figure 1. Methodology steps

2.1. Framework analysis

To provide a VR-based approach, it is essential to take into consideration the two main axes of the project: the digital skills and the training on soft skills. These competences are included in different existing competency frameworks. Such frameworks can inform the development of the final product and, hence a preliminary analysis was carried out. These frameworks were selected because they are related to digital literacy and digital skills, but also because they are related to the other essential part of the project, soft skills. The different frameworks used were as follows:

- European Key Competencies Framework (European Parliament and the Council, 2006);
- DigCompEdu (EU, 2017);
- ICT Competency Framework for Teachers (Unesco, 2011);

- New Values, Skills and Knowledge Model (NIE, 2009) and
- Selected social and emotional skills for inclusion in the SSES (Chernyshenko, Kankaraš, & Drasgow, 2018).

This analysis was useful to have a clear picture and, above all, a context about the frameworks that could help to develop the Project's framework. This framework would be directly related to Virtual Reality (VR), as those parts that corresponded most closely to the objectives of the project would have been selected, choosing specific competences from each framework.

These competences, taking into account the nature of the framework to which they belong, have been further grouped into 3 main groups. These groups belong to the main categories of the project: Digital Competence, Personal Competence, and Civic Competence. The groupings can be found in questions 40 to 45 of the survey attached in Annex I.

2.2. Survey

From this previous selection of frameworks and competences, a questionnaire was designed (Annex I) to investigate the needs of teachers, particularly after the impact of the COVID-19 pandemic. Teachers (both in-service and pre-service) constitute the main target audience of the VRTEACHER project and will be the ones to use the project's results. Hence the identification of their real needs will help the consortium address those needs and provide a VR training tool of high quality and added value. Additionally, through the survey, the partnership was able to assess how important it is to work on the competences selected in the previous analysis.

This questionnaire was implemented using the SurveyMonkey tool and was translated into all partner languages. The target group of the questionnaire was teachers and higher education students (potential teachers).

The final questionnaire had a total of 24 questions, divided into 4 different sections. The first block consisted of 3 questions that aimed to collect demographic data, such as the country of residence, gender, and the profile of participants. This first block was common to both teachers and students.

Depending on the user's profile, configured by the answers provided in this first block, the questionnaire diverted into 2 different blocks: "General information for teachers" or "General information for students". Both blocks consisted of 18 questions. These two blocks aimed to collect the challenges faced by both profiles during the pandemic and in virtual classrooms.

The third block called "VRTEACHER Project Framework", was common to both profiles collected the questions related to the previously selected competences. Competences were grouped into 3 general areas: Digital Competences, Personal Competences, and Civic Competences. Participants had to answer how important they considered each of the skills

between a range of scores from 1 to 6, where 1 was very unimportant and 6 was the most important.

Finally, the fourth block, called "Other Competences", included other competences from the reviewed frameworks that were not strictly related to the aim of the VRTEACHER project but were intended to serve as preliminary research for future works and studies. These competences, like those in block 3, were divided into 3 general areas: Digital Competences, Personal Competences, and Civic Competences, and were evaluated using the same scale.

Once the results were collected, a selection of key competences was made to work with the Virtual Reality tool developed in the project. The score obtained in each of the competences was considered; however, not all of the highest-scoring competences were selected. To make this decision, the consortium had to take into consideration the strengths but also the limitation of VR technology and low-cost equipment that was decided to be used under this project during the preparation stage of the proposal to ensure that the VR application is accessible to the target audience. Those limitations led to the identification of the VRTEACHER competence framework and the development of suitable training scenarios that reflect reality and also address the real needs of teachers. Those that were not selected, but obtained a high score, will be considered for future discussion and research. The VRTEACHER project aims to form the basis for future initiatives in the field and provide a training tool that could be enriched with new scenarios that target the empowerment of other skills and competences.

2.3. Focus groups

After the end of the survey and the analysis of the results, the consortium conducted focus groups, to investigate in more depth, the needs of the target audience and their expectations of a VR training tool. The consortium created simple questions to guide the focus groups. These questions were as follows:

- Share a crisis management incident that took place those two years of covid. How did they handle it?
- How do teachers currently address empathy in the classroom?
- Which soft skills (accessibility & inclusion, stress resistance, self-control, empathy, assertiveness, self-efficacy and decision-making) would you be more interested in working on?
- Share your expectations regarding the virtual world (utility, design, categorization of the scenario to training cases)
- What kind of feedback do they expect to get during the interaction with the virtual world?
- What kind of feedback do they expect to get when the training finishes?

- If you were provided with a free VR training tool as part of the training methodology, would you use it?

These discussions aimed to get a realistic idea of working on the chosen competences in the classroom and, on the other hand, to get to know their previous knowledge about Virtual Reality and to gather their vision about expectations about the scenarios and best practice advice offered by the tool and other aspects related to the interaction with the tool.

For this purpose, each partner country carried out a focus group with the target group consisting, in this case, of teachers of any educational level, university students with the education degree, and ICT experts. The groups had to be made up of a minimum of 4 people, including a teacher, a student, an ICT expert, and another of the above. To collect information from the participants, a registration form was created in Survey Monkey.

Five Focus Groups were conducted in December 2021 in the following countries: Cyprus, Greece, Spain, Ireland, and Malta and they brought together a total of 25 people. All of them were conducted online, except the one in Spain which was hybrid. The Cyprus group consisted of 4 people, the Greece group of 4, the Spain group of 8, the Ireland group of 5, and the Malta group of 4. The ages of the participants varied widely due to the different profiles approached. All of them were in the range of 18-70 years old. In terms of gender, among the 25 total participants, 13 were female and 12 were male.

Taking into account the information obtained in the focus groups that explains, on the one hand, the reality of the teaching practice during the pandemic and, on the other hand, the importance of working on soft skills with students, and taking also into account the results of the questionnaires, the VRTEACHER project has the ambition to provide effective education responses related to educator's training via using a novel VR-based pedagogical approach for virtual practicum.

3. Framework analysis

Competences are the sum of knowledge, skills, and individual characteristics that enable a person to perform actions. This term was born as a response to the limitations of the traditional education system, focusing on the ability of each individual to perform specific tasks and not only on the knowledge acquired (Zabala and Arnau, 2008).

Regarding identifying the basic competences of students, in 2006 the European Parliament and the Council set out 8 key competences to be developed by students for the sake of achieving a well-rounded education in all aspects of life. In this document, competences are defined as a combination of knowledge, skills, and attitudes necessary for the personal fulfilment and development of each individual, for active citizenship, social inclusion, and access to employment.

The following image provides a visual overview of all of them:

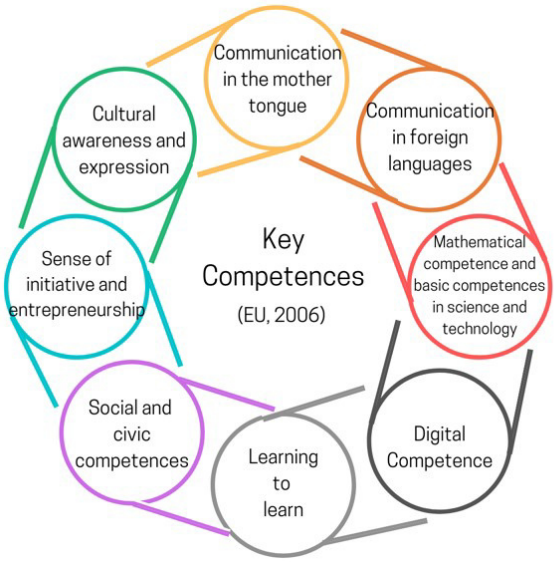

Figure 2. European Key Competencies Framework (European Parliament and the Council, 2006)

With reference to the latest written document on the subject, the Council of the European Union carried out 2018 an updated review of the proposed key competences, aiming to:

1. Promote high-quality lifelong learning for all people.
2. Support teachers in the implementation of methodologies and learning based on the development of competences.
3. Encourage the creation of learning contexts that help to develop lifelong learning.
4. Adapt assessment to address the validation of competence acquisition.

In this document (EU, 2018 p.189/7), key competences are defined as "*those that all people need for personal fulfilment and development, employability, social inclusion, sustainable lifestyles, successful living in peaceful societies, healthy lifestyles and active citizenship*".

The same areas proposed in 2006 are maintained, though some names vary. These are the definitive ones:

1. Competence in reading and writing.
2. Multilingual competence.
3. Competence in mathematics and competence in science, technology, and engineering.
4. Digital competence.
5. Personal, social, and learning to learn competence.
6. Citizenship competence.
7. Entrepreneurial competence.
8. Competence in cultural awareness and expression.

For this conceptual framework, we will focus on three key competences: digital competence, personal competence, and civic competence which are those directly related to VRTEACHER goals.

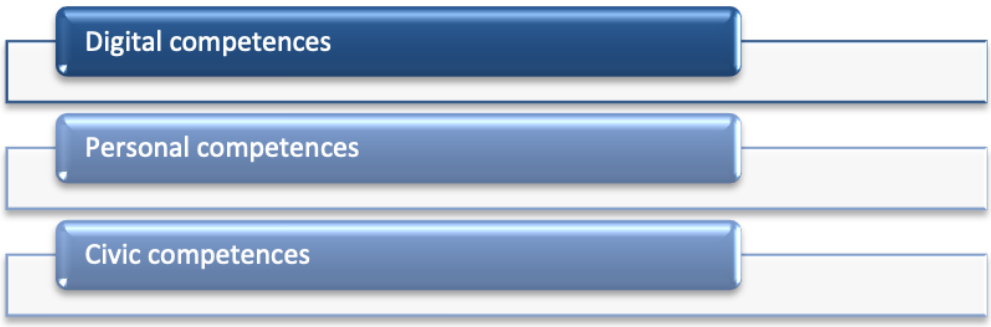

Figure 3. Digital, Personal and Civic competences

3.1. Digital competences

Digital competence (EU, 2018) involves the use of new technologies in a safe, critical, and responsible way, both in a work or learning environment and for participation in society. To achieve this, students need to be aware of the risks, effects, and limitations of digital technologies but also understand how they can foster communication, creativity, and innovation.

Frameworks have been created to develop this competence with teachers so that they can use it in their teaching practice and thus also train their students in this skill. One example of these frameworks is DigCompEdu, a framework that develops 22 digital competences split

into 6 different themes which are in turn divided into three broad areas. The three broad areas refer to the professional competences of educators, the pedagogical competences of educators, and the competences of learners.

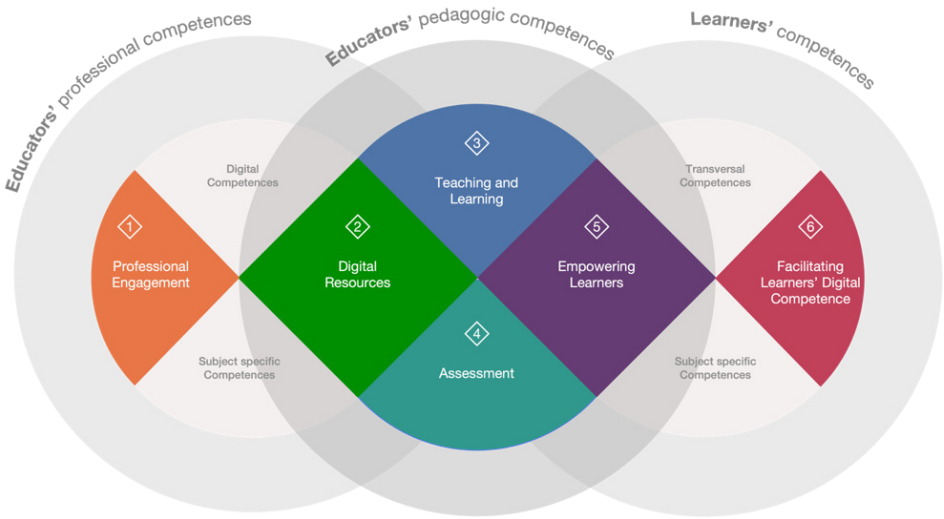

Figure 4. DigCompEdu Framework (EU, 2017)

The six themes on which the competences are developed are as follows:

- **Professional engagement.** Included in the educators' professional competences, this topic encompasses four competences: organizational communication, professional collaboration, reflective practices, and digital CPD.
- **Digital resources.** Included in the educators' pedagogic competences, this topic encompasses three competences: selecting, creating & modifying, and managing, protecting, sharing.
- **Teaching and learning.** Included in the educators' pedagogic competences, this topic encompasses four competences: teaching, guidance, collaborative learning, and self-regulated learning.
- **Assessment.** Included in the educators' pedagogic competences, this topic encompasses three competences: assessment strategies, analyzing evidence, and feedback & planning.
- **Empowering learners.** Included in the educators' pedagogic competences, this topic encompasses three competences: accessibility & inclusion, differentiation & personalization, and actively engaging learners.
- **Facilitating learners' digital competence.** Included in the learners' competences, this topic encompasses five competences: information & media literacy, communication, content creation, responsible use, and problem-solving.

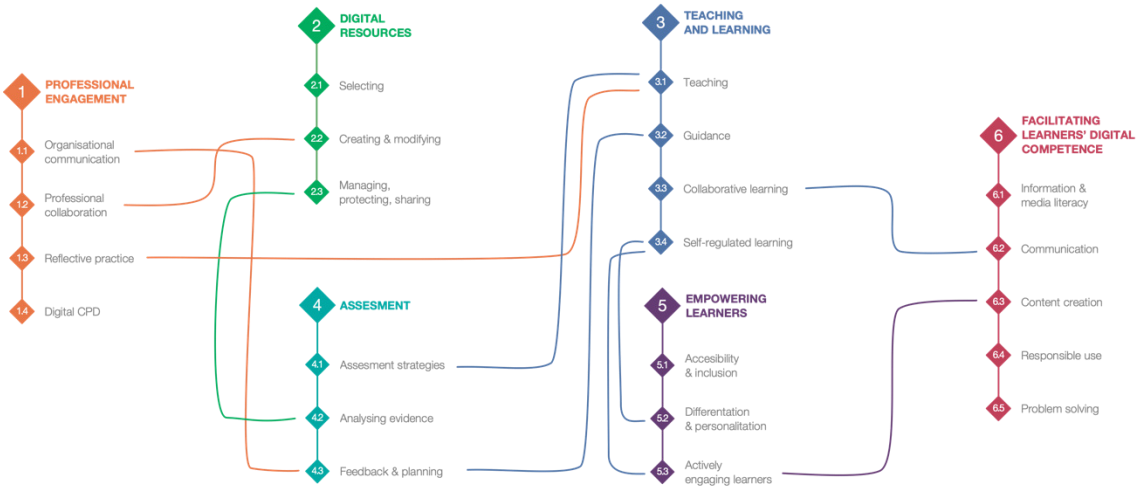

Figure 5. DigCompEdu Framework (EU, 2017)

This document aims to find out how being digitally competent can help us to develop personal and citizenship competences. It is precisely the ability to apply digital skills to transform the reality around us the competence we find in the framework proposed by UNESCO and on which we will focus in this project. This version of the framework emphasizes that teachers must be able to use ICT to help students become collaborative, creative, problem-solving, socially engaged learners, as well as have ICT skills and the ability to develop them (UNESCO, 2018).

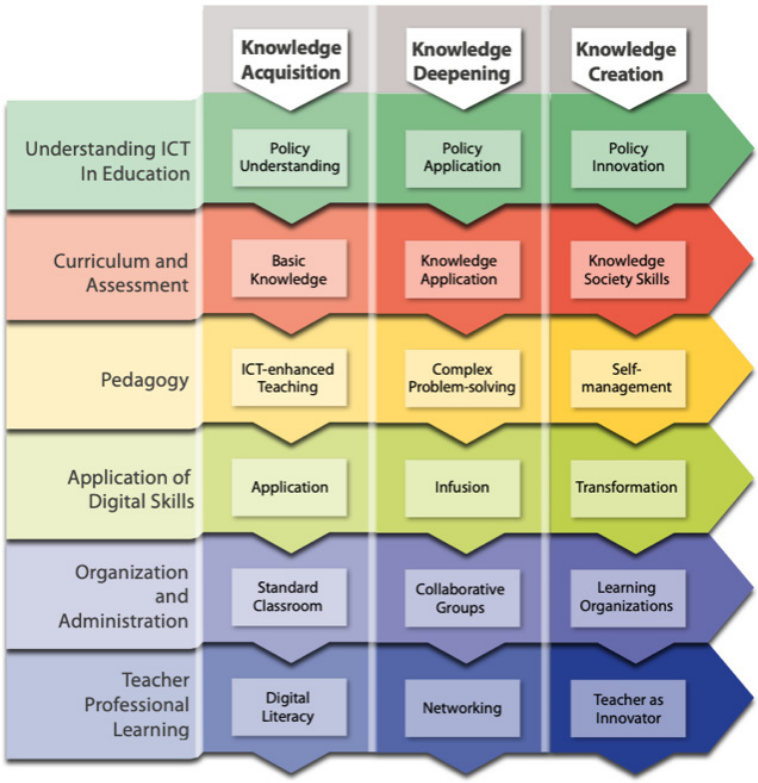

Figure 6. ICT Competency Framework for Teachers (UNESCO, 2018)

As mentioned above, it is competence four the one we are most concerned within this document, so we will focus on it to deal with the topic of Virtual Reality in education: application of Digital Skills.

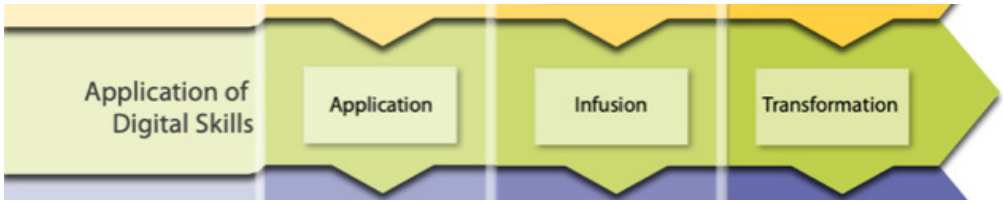

Figure 7. ICT Competency Framework for Teachers (UNESCO, 2018*)*

3.2. Personal and Civic competences

Continuing with the other two key competences to be addressed in this document, **personal, social, and learning to learn competence** (EU, 2018) is the ability of each person to know themselves and know how to manage time to their advantage. It is knowing one's ability to work effectively in a team, to be resilient, to know how to manage emotions, and to act assertively by knowing how to manage conflicts. In addition, this competence is about physical and mental health.

On the other hand, **citizenship competence** (EU, 2018) is the ability to participate actively in social and civic life in a responsible way, knowing the basic concepts concerning the individual, the group, the organization of society, work, and the laws that govern it. This implies knowledge of common values, both at the national and European level, as well as a critical view of the historical events that have influenced the reality of our society today.

To be able to work on both skills with virtual reality devices and software, it is necessary to understand what are the specific sub-competences or domains that we need to address. We need to know what specifically implies working on these two competences.

The Basque Government (2015) points out four important components to develop these two competences:

- communication,
- teamwork,
- behaving according to ethical principles and social norms, and
- problem-solving.

Communication refers to the ability to communicate feelings, thoughts, and desires assertively, and to listen actively and empathetically to the feelings, thoughts, and desires of others. Assertiveness is the way of communicating effectively, saying what one wants to convey in a firm and respectful manner (Cañón-Montañez & Rodríguez-Acelas, 2011) and

empathy is the ability to recognize and understand the mental states of other people, with respect to their emotions and feelings (López, Arán & Richaud, 2014).

Teamwork promotes social interaction among students which, according to Piaget, is necessary for the development of higher intellectual structures, whose role is decisive for learning (Bello, 2016). Within teamwork, two modalities stand out: collaborative learning and cooperative learning. Cooperative learning is the most complete as, in addition to developing the competence of learning to learn, it also develops the competence of learning to live in society.

Behaving in accordance with ethical principles and social norms, is based on the ethical principles of human rights, universal principles that aim to dignify all human life. In this component, we can highlight the values of equality, recognizing that one has the same rights and obligations as others; justice and fairness, acting to redress situations of inequality and oppression, and committing to defend the values that are considered fundamental (Basque Government, 2015).

Problem-solving consists of knowing how to deal with conflict situations, managing them through dialogue and negotiation. It is of paramount importance for teachers to be educated in conflict resolution and in the strategies that should be implemented to solve them (de Armas Hernández, 2003).

As for digital competence, different frameworks have been created to work on social and civic competences, one of them being the Teacher Education Model for the 21st Century, written by the National Institute of Singapore (2009). This framework outlines the new values, skills, and knowledge that teachers need to acquire to practice their profession in a positive and optimal way. These attributes are centered on both personal and community values, addressing the four components mentioned above.

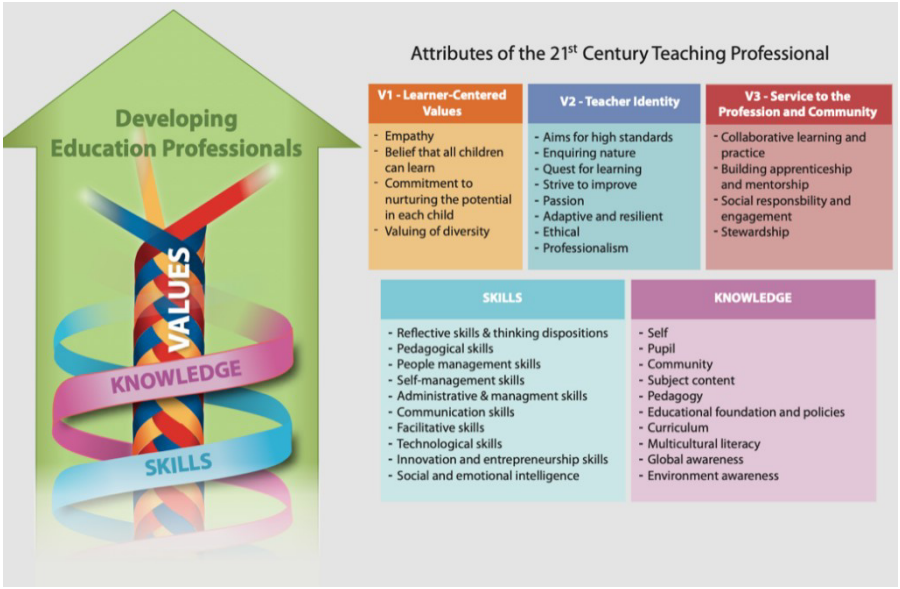

Figure 8. New Values, Skills and Knowledge Model (NIE, 2009)

With regard to the personal and emotional education of students, the OECD proposes a framework that sets out the 5 domains for including social and emotional skills in the classroom (Chernyshenko, Kankaraš, & Drasgow, 2018). This framework, while directed at students, also outlines the skills that teachers must have in order to educate in these domains and make them proficient in all of them. These components further deepen the emotional sub-competences seen in the Singapore framework, thus being two compatible frameworks that can be addressed together.

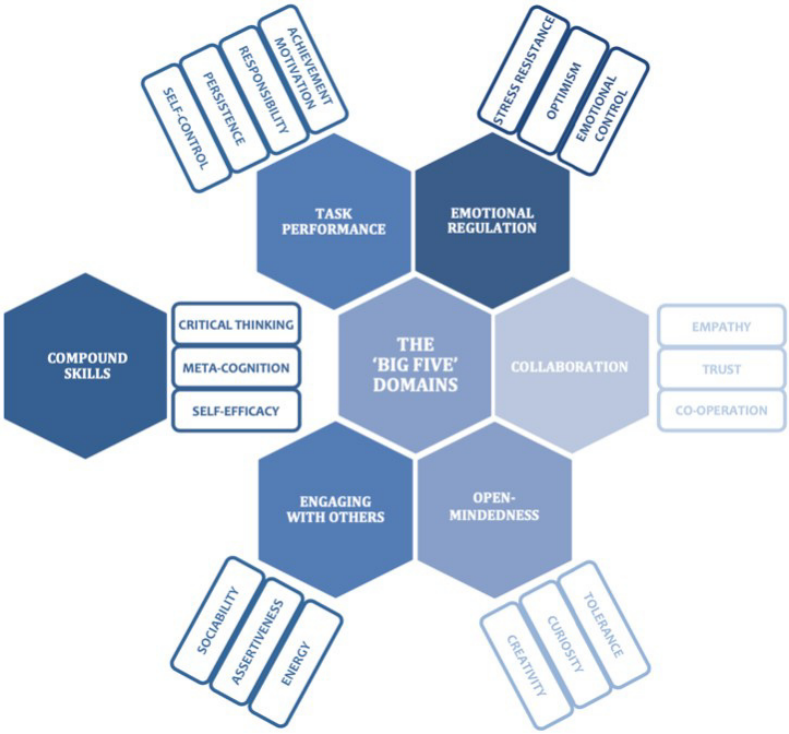

Figure 9. Selected social and emotional skills for inclusion in the SSES (Chernyshenko, Kankaraš, & Drasgow, 2018)

Following this review, a number of competences have been selected and grouped into different areas. These areas correspond to the 3 main axes of the project: Digital Competence, Personal Competence, and Civic Competence; selected from the Key Competences framework by the European Parliament and the Council (2018).

A search was carried out for frameworks that worked on these skills: Digital Competences (DigCompEdu and UNESCO), Personal Competences (Singapore and OECD), Civic Competences (Singapore and OECD). When analysing these frameworks, it was observed that there were skills that were repeated in more than one, thus selecting a set of skills that could be worked with virtual reality, bearing in mind the objectives of the project and the scenarios that are going to be created with the VR tool.

The following tables show graphically the specific competences and skills selected from each of the frameworks analyzed and the area to which they belong:

Table 1. Key Competences

European Key Competencies Framework (European Parliament and the Council, 2018)	Related to VRTeacher Framework
Competence in reading and wirting	
Multilingual Competence	
Competence in mathematics and competence in science, technology and engineering	
Digital Competence	X
Personal, social and learning to learn competence	X
Citizenship competence	X
Entrepreneurial competence	
Competence in cultural awarenes and expression	

Table 2. Digital, Personal and Civic Competence

DIGITAL COMPETENCE				
Competence	**DigCompEdu**	**UNESCO**	**Singapore**	**OECD**
Accesibility & Inclusion	X			
Differentiation & Personalization	X			
Actively engaging learners	X		X	X
Problem Solving	X	X		
Collaborative learning	X	X	X	
Self-Regulated learning	X	X	X	
Guidance	X		X	
Teaching	X			
Assesment strategies	X	X		
Analysis evidence				
Application of digital Skills				
Understanding ICT in education				
PERSONAL COMPETENCE				
Competence	**DigCompEdu**	**UNESCO**	**Singapore**	**OECD**
Emotional control			X	X
Stress resistance			X	X
Responsibility			X	X

Persistance			X	X
Self-control			X	X
CIVIC COMPETENCE				
Competence	**DigCompEdu**	**UNESCO**	**Singapore**	**OECD**
Empathy			X	X
Trust			X	X
Co-operation	X	X	X	X
Tolerance			X	X
Asserivenes			X	X
Sociability			X	X
Social responsibility and engagement			X	X
Valuing of diversity			X	X
Ethics			X	

4. Survey

As mentioned above, the questionnaire resulted from the previous selection of frameworks and competences. The questionnaire aimed at finding out the needs of the target groups of the project and, thanks to it, it was possible to contrast how important it is to work on the selected competences in the classroom.

The final questionnaire had a total of 24 questions, divided into 4 sections. There was a total of 340 responses from all participating countries. The complete results are available at < https://www.surveymonkey.com/results/SM-RB7RSQ7J9/>.

The **first section** (for both teachers and students) consisted of 3 questions and had the objective of collecting demographic data such as the country of residence, gender, and the profile of each participant.

Concerning responses by country the following responses were collected: 154 Greece, 20 Cyprus, 23 Malta, 31 Ireland, 108 Spain, and 4 from other countries (2 from Morocco, 1 from China, and 1 from America). It was also noted that a large majority of participants were women (70.88%) and almost 60% were higher education students.

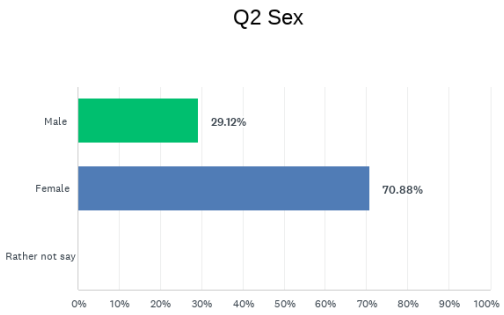

Figure 10. Sex

Depending on the user profile, configured by the answers provided in this first block, the questionnaire was bifurcated into **2 different sections**: "General teacher information" or "General student information". Both parts consisted of 18 questions to collect the challenges faced by both profiles during the pandemic and in the virtual classrooms.

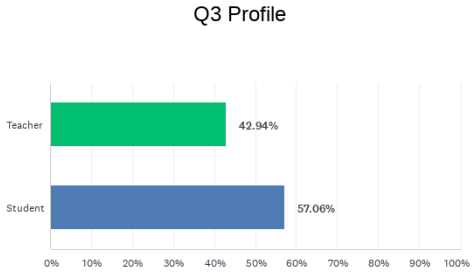

Figure 11. Profile of the participants

“General teacher information”

The first question in this section aimed at finding out what level of education the teachers surveyed belonged to. 53.42% of them teach in Primary Education, and only 14.38% in Higher Education or University.

The rest of the questions have been set between a range of scores from 1 to 6, where 1 was the most negative score and 6 was the most positive. Participants were asked to respond to scenarios and challenges they faced during the virtual classroom period due to the Covid-19 lockdown.

Different conclusions have been drawn from this section related to the use of digital platforms in teaching and the challenges faced regarding interaction with students.

Participants scored 4.3 (several new tools have been integrated) when asked whether or not they had integrated digital platforms or tools into their teaching practice. It is concluded that a large proportion of teachers already have experience in integrating digital tools into online teaching.

In relation to the question of whether the educational objectives have been achieved despite the situation, the participants rated the question with an average of 4.1 (some learning outcomes and objectives were attained). This shows positively that the use of digital tools did not hinder the good development of the educational process.

In terms of potential problems during such a period, the most common seems to be technical issues such as "internet access" or "use of computers".

Also, questions related to teachers' training in soft skills and their implementation in virtual and face-to-face classes were asked. Although both questions were answered with a fairly high score, teachers felt more comfortable dealing with emotional and affective issues in a face-to-face classroom (4.7) than in an online classroom (3.7).

On the question of how much experience they had with Virtual Reality-type technologies, the participants rated their experience with 2.7 (moderately experienced). On the other hand, regarding the usefulness of Virtual Reality in teaching, the participants rated it 4.1 (useful). This implies that a large number of teachers might enthusiastically welcome training in this type of technology.

“General students’ information”

The first question in this section was aimed at finding out at which educational level the participating students were enrolled. Most of them, almost 80%, were university students.

The rest of the questions in this section have been set between a range of scores from 1 to 6, where 1 was the most negative score and 6 was the most positive. Participants were asked to respond to scenarios and challenges they faced during the virtual classroom period due to the Covid-19 lockdown.

Different conclusions have been drawn from this block related to the use of digital platforms in teaching and the challenges faced regarding interaction with teachers and peers.

As in the section for teachers, a very high number of students rated with 4.6 (a wide range of new tools have been integrated) the question about at what level they had integrated additional platforms and tools in the virtual classrooms.

Also, with an average score of 4.3 (some learning outcomes and objectives were attained) they rated the question of whether the educational objectives have been achieved despite the situation.

The ratings for the questions related to participation in activities related to emotionality or affectivity in face-to-face or virtual classes were both answered with high scores, but the question concerning face-to-face classes scored higher (4.1) than the one concerning online lessons (3.6).

On the question of how much experience they had with Virtual Reality-type technologies, the students rated their experience with 2.9 (moderately experienced). On the other hand, regarding the usefulness of Virtual Reality in the training of students, the participants rated it with 4.3 (useful).

The third section, called "VRTEACHER Project Framework", and common to both profiles, collected questions related to the previously selected competences, grouping them into 3 general areas:

- Digital Competences,
- Personal Competences and
- Civic Competences.

Regarding this last part, users had to answer how important they considered each of the skills between a range of scores from 1 to 6, where 1 was very unimportant and 6 the most important.

“Digital competence”

The digital competences with the highest scores from participants (both teachers and students) were: "Actively engaging learners" with a score of 4.81 out of 6; "Problem-solving" with 4.72; and "Collaborative learning" and "understanding ICT in education" with a total of 4.68. (In red, are the most voted competences. In green, the competences chosen for the project's Framework).

Table 5. Digital Competences – Teachers and Students

	1.	2.	3.	4.	5.	6.	TOTAL	WEIGHTED AVERAGE
Accesibility & Inclusion	3.82% 13	4.12% 14	13.82% 47	19.71% 67	22.06% 75	36.47% 124	340	4.61
Differentation & Personalisation	2.35% 8	4.41% 15	15.59% 53	26.47% 90	24.41% 83	26.76% 91	340	4.46
Actively engaging learners	2.65% 9	3.53% 12	7.94% 27	20.00% 68	27.35% 93	38.53% 131	340	4.81
Problem Solving	0.88% 3	5.88% 20	9.71% 33	21.47% 73	27.65% 94	34.41% 117	340	4.72
Collaborative learning	1.78% 6	4.45% 15	9.79% 33	24.93% 84	26.41% 89	32.64% 110	337	4.68
Self-regulated learning	2.95% 10	4.13% 14	12.39% 42	26.55% 90	27.43% 93	26.55% 90	339	4.51
Guidance	2.07% 7	4.73% 16	14.50% 49	26.33% 89	27.22% 92	25.15% 85	338	4.47
Teaching	3.25% 11	5.92% 20	10.06% 34	20.41% 69	28.11% 95	32.25% 109	338	4.61
Assesment strategies	2.39% 8	4.48% 15	9.55% 32	29.25% 98	28.66% 96	25.67% 86	335	4.54
Analysing evidence	1.18% 4	6.47% 22	13.53% 46	29.12% 99	28.53% 97	21.18% 72	340	4.41
Application of Digital Skills	2.65% 9	3.24% 11	11.80% 40	19.17% 65	33.04% 112	30.09% 102	339	4.67
Understanding ICT in Education	3.55% 12	4.44% 15	10.36% 35	18.34% 62	28.40% 96	34.91% 118	338	4.68

"Personal competences"

The personal competences with the highest score by the participants (both teachers and students) were: "Stress resistance" with a score of 4.54; "Emotional control" with 4.57; and "Self-control" with 4.52. (In red, are the most voted competences. In green, the competences chosen for the Framework of the project).

Table 6. Personal Competences – Teachers and Students

	1.	2.	3.	4.	5.	6.	TOTAL	WEIGHTED AVERAGE
Emotional control	4.71% 16	7.35% 25	10.29% 35	17.94% 61	22.65% 77	37.06% 126	340	4.58
Stress resistance	2.66% 9	8.28% 28	7.10% 24	18.64% 63	21.01% 71	42.31% 143	338	4.74
Responsibility	7.06% 24	6.18% 21	10.88% 37	16.47% 56	23.82% 81	35.59% 121	340	4.51
Persistence	7.14% 24	6.85% 23	8.93% 30	17.86% 60	24.11% 81	35.12% 118	336	4.50
Sel-control	5.92% 20	10.06% 34	8.88% 30	15.09% 51	21.01% 71	39.05% 132	338	4.52

“Civic competences”

The civic competences with the highest scores by the participants (both teachers and students) were: "Valuing of diversity" with a score of 4.59; "Trust" and "Co-operation" with 4.57; and "Social responsibility and engagement", "Sociability" and "Assertiveness" with 4.53. (In red, are the most voted competences. In green, the competences chosen for the Framework of the project).

Table 7: Civic Competences – Teachers and Students

	1.	2.	3.	4.	5.	6.	TOTAL	WEIGHTED AVERAGE
Empathy	6.76% 23	8.53% 29	10.88% 37	14.71% 50	18.53% 63	40.59% 138	340	4.51
Trust	5.59% 19	7.06% 24	10.00% 34	18.24% 62	20.59% 70	38.53% 131	340	4.57
Co-operation	5.90% 20	8.55% 29	9.44% 32	13.57% 46	23.89% 81	38.64% 131	339	4.57
Tolerance	3.28% 11	8.66% 29	12.54% 42	19.10% 64	20.00% 67	36.42% 122	335	4.53
Assertiveness	2.66% 9	8.28% 28	10.65% 36	23.67% 80	21.30% 72	33.43% 113	338	4.53
Sociability	5.31% 18	8.55% 29	10.32% 35	18.29% 62	22.42% 76	35.10% 119	339	4.49
Social responsability and engagement	4.41% 15	10.29% 35	10.59% 36	16.47% 56	19.12% 65	39.12% 133	340	4.53
Valuing of diversity	7.10% 24	8.88% 30	7.69% 26	13.91% 47	19.53% 66	42.90% 145	338	4.59
Ethics	10.32% 35	8.85% 30	7.37% 25	10.62% 36	19.76% 67	43.07% 146	339	4.50

Finally, the **fourth** section, called "Other Competences", included other competences from the reviewed frameworks that were not so much related to the aim of the VRTEACHER project but were intended to serve as preliminary research for future work and studies. These competences, like those in block 3, were divided into 3 general areas: Digital Competences, Personal Competences, and Civic Competences.

“Digital competence”

The digital competences with the highest scores from participants (both teachers and students) were: "Responsible use" with a score of 4.48 out of 6; "Reflective practices" with 4.49; and "Managing, protecting, sharing" with a total of 4.37. (In red, are the most voted competences. In green, the competences chosen for the project's Framework).

Table 8. Digital Competences (Other) – Teachers and Students

	1.	2.	3.	4.	5.	6.	TOTAL	WEIGHTED AVERAGE
Selecting	5.29% 18	8.53% 29	17.65% 60	18.53% 63	27.06% 92	22.94% 78	340	4.22
Creating & Modifying	5.03% 17	6.51% 22	14.79% 50	23.08% 78	28.11% 95	22.49% 76	338	4.30
Managing, protecting, sharing	4.73% 16	7.99% 27	13.61% 46	20.41% 69	25.44% 86	27.81% 94	338	4.37
Responsible use	6.49% 22	9.14% 31	11.50% 39	14.75% 50	19.17% 65	38.94% 132	339	4.48
Reflective practice	4.42% 15	5.01% 17	16.22% 55	17.99% 61	24.48% 83	31.86% 108	339	4.49

"Personal competences"

The personal competences with the highest scores by the participants (both teachers and students) were: "Critical thinking" and "Adaptive and resilient" with a score of 4.57; "Achievement motivation" and "Meta-cognition" with 4.51; and "Self-efficacy" with 4.48. (In red, are the most voted competences. In green, the competences chosen for the project's Framework).

Table 9. Personal Competences (Other) – Teachers and Students

	1.	2.	3.	4.	5.	6.	TOTAL	WEIGHTED AVERAGE
Optimism	5.29% 18	8.82% 30	12.06% 41	15.29% 52	25.29% 86	33.24% 113	340	4.46
Achievement Motivation	4.42% 15	6.19% 21	14.16% 48	16.81% 57	25.66% 87	32.74% 111	339	4.51
Critical Thinking	5.64% 19	8.31% 28	10.68% 36	13.95% 47	21.66% 73	39.76% 134	337	4.57
Meta-Cognition	2.65% 9	7.37% 25	12.39% 42	20.06% 68	28.32% 96	29.20% 99	339	4.52
Self-Efficacy	4.75% 16	5.93% 20	15.73% 53	15.43% 52	26.41% 89	31.75% 107	337	4.48
Adaptive and resilient	4.42% 15	7.08% 24	10.62% 36	16.52% 56	27.14% 92	34.22% 116	339	4.58

"Civic competences"

The civic competences with the highest scores by the participants (both teachers and students) were: "Creativity" with a score of 4.68; "Energy" with 4.51; and "Curiosity" with 4.27. (In red, the most voted competences. In green, the competences chosen for the project's Framework).

Table 10: *Civic Competences (Other) – Teachers and Students*

	1.	2.	3.	4.	5.	6.	TOTAL	WEIGHTED AVERAGE
Curiosity	5.88% 20	9.71% 33	15.00% 51	19.41% 66	20.88% 71	29.12% 99	340	4.27
Creativity	2.94% 10	5.59% 19	11.47% 39	19.71% 67	20.88% 71	39.41% 134	340	4.68
Energy	3.55% 12	7.99% 27	12.43% 42	20.41% 69	21.30% 72	34.32% 116	338	4.51

Once the results were collected, a selection of key competences was made to work with the Virtual Reality tool developed in the project. The score obtained in each of the competences was considered; however, not all of the highest-scoring competences were selected. The consortium, having in mind the tool that is going to be used for the creation of the scenarios, its limitations, and the possibility to assess the competences addressed in them, concluded that the following competences will be the chosen ones to be worked in this project:

- accessibility & inclusion,
- stress resistance,
- empathy,
- self-efficacy and,
- decision-making.

Those that were not selected, but obtained a high score, will be considered for future discussion and research.

5. Customization of the existing VR Tool, limitations and identifications of the VRTEACHER competence Framework.

The selection of the competences to be cultivated using the VR tool depends on the technological restrictions imposed by the proposed VR. For this reason in this section we discuss the following topics that explain why we have chosen the final competences:

- Information about the tool that we are going to use in the project, to understand the limitations of the tool, and the proposed hardware.
- Talk about existing evaluation frameworks and why are they useful and which are the ones created to assess Soft Skills, to understand that some of the skills are difficult to assess with the tool.
- Brief summary to connect this reflection with the formulation of the questions for the focus groups.

5.1. Existing VR tool to be customized

Cyprus University of Technology (CUT) developed the previous years a VR training tool targeting the cultivation of empathy, to investigate the potential of using VR-based methods in teacher education and training. The need arose from the major challenge that teacher education faces today is the lack of practical training or "on the job" training in an era where classrooms are more dynamic than ever, while they have become digital and diverse. Teachers lack the mentoring and support that they need feeling stressed and unprepared to confront the needs of today's classrooms. COVID-19 impacted severally the delivery of education and practical training itself due to social isolation restrictions and with the primary importance of the safety of the students, it is very difficult to practice in a real classroom. To address this challenge, researchers from CUT investigated the potential of using novel and technology-based approaches that could offer teachers a safe virtual environment for experimentation and learning by doing, without risking harming a real student.

The development of the VR tool followed a five-phase model and was developed from scratch with the active involvement of the target audience. Phase I included a state-of-the-art analysis of the literature review and a survey that aimed to identify the real needs of teachers. Based on the findings the competence framework for the VR tool was identified by targeting empathy. Empathy was selected due to the fact that it was proposed by teachers as a top skill but was not included in European Competence models and was included only in a competence model by the National Institute of Education-NIE (2009). Equally important is that VR is an "empathy-inducing médium" (Carey et al., 2017, p. 1) offering users a unique opportunity to change perspective and experience another person's perspective (Raij et al., 2009). Entering another person's position enables the user to see what others see, hear what others hear, move how others move, and feel the emotions others feel (Raij et al., 2009). The

ability to change from the virtual body of the teacher and enter the virtual body of the student makes VR a valuable tool for teacher training allowing teachers to enter the shoes of a student and experience a situation. The third phase concerned the development of the VR scenarios and the fourth phase concerned the design and development of the VR tool environment (3D models). After close collaboration with in-service teachers, interviews, surveys, and the use of evaluation tools such as electroencephalogram (EEG) under phase five the appearance of the virtual environment was shaped, the training scenario was finalized and the impact of perspective change was validated (Baka et al, 2018; Stavroulia et al., 2018). What is more, the results indicated that the users-teachers had strong emotional experiences during the use of the VR tool (Stavroulia et al., 2018; Stavroulia et al., 2019) that is highly related to the sense of presence that is '*the subjective impression that the virtual environment in which a person is immersed really exists*' (Bouchard, 2010, p. 24). During the final evaluation of the VR tool, the most significant outcome of the ANOVA statistical analysis was that the VR intervention had a statistically significant effect on participants' empathy only if their changed virtual body (perspective-taking) entering from the virtual body of the teacher to that of the student. This first research indicated the potential to use VR-based training methodologies to cultivate teachers' skills including empathy. This preliminary investigation formed the basis of the current project during the preparation of the application, with the vision to customize the existing tool, update the scenarios by taking into consideration the impact of the pandemic and target new skills and competences.

Figure 12. The main scene of the existing VR training tool

Figure 13. Selection of character scene

5.2. Limitations of the VR tool within the framework of the VRTEACHER project

The initial VR training tool was designed for high-resolution equipment that offers users maximum experience. More specifically, Oculus Rift VR equipment was used during the pilot testing with end-users, in-service and pre-service teachers (figure 12).

Figure 14. One of the participants during the VR intervention

Teachers are quite unfamiliar with the use of this technology; hence it was essential to investigate the impact of such a tool using the best possible equipment in terms of quality. The problem with this equipment is that it comes with a high cost for a school unit or an education department to purchase (around 400€) as a large number of headsets must be purchased to train all those teachers. Equally important is that VR technology evolves at a fast pace, with today's VR equipment being obsolete within a year. For example, Oculus Rift which was used for the VR prototype is no longer available. This means that school units or educational departments would have to constantly upgrade their equipment, which is not an option. What is more, a powerful pc is required to use such equipment that has also a high cost for a school unit to buy while it is possible that in many cases this equipment could not be used by the staff.

To address those challenges during the preparation stage of the VRTEACHER project it was decided by the partnership that low-cost VR equipment based working with mobile phones (androids) could solve the problem and provide a novel training tool but at an affordable cost for a school unit, an education department or a teacher. For this reason, it was decided to customize the existing tool, convert it to become android compatible and be able to work with low-cost equipment of even 10€ (figure 15).

Figure 15. Cardboard VR headset

Using low-cost equipment will allow a teacher to download the application to his/her mobile phone and be trained using even cardboard equipment.

The challenge of this change concerning the VR equipment lies in the lower quality lenses that could often make VR scenes look blurry, decreasing the levels of realism. This was taken into serious consideration by the partnership as the VRTEACHER project aims to provide a high-quality training tool that has added value to teachers and impact to their training and professional development. To overcome such obstacles the training scenarios under the VRTEACHER project will be very clear in terms of the messages they want to pass and also the interaction within the VR application will be designed in a friendly way that will not decrease the level of realism, the sense of presence to the virtual world and the understanding of the scenarios by end-users.

For this reason, it was clear to the partnership that under the VRTEACHER project not all competences and skills identified by the survey could be addressed. A selection had to be made taking into consideration the needs of the target audience but also the limitation of the VR equipment and the timeframe of the project. This formed the basis of the first set of competences that were further explored during the focus groups, to identify the expectations of end-users concerning those competences and also the ability to develop real-life-based scenarios that match those skills. After conducting the focus groups the partnership discussed the final competence framework to be addressed via the VR training tool. The Cyprus University of Technology along with Universidad Carlos III de Madrid, which are the two partners occupied with the development of the VR tool, set the limitations to the partnership along with the project's timeframe leading to the final decision regarding the competence framework of the VRTEACHER project. For example, although assertiveness scored high in the survey results, focus groups revealed that assertiveness as a concept was unclear to many teachers. This could have a negative impact on their understanding of the scenario, while evaluating the impact of the VR intervention in the cultivation of these skills could be challenging if teachers are not fully aware of the concept of assertiveness.

The identified competence framework can be matched with the scenarios under development, providing a clear picture to the target audience. Empathy constitutes the main pillar of the VR application empowered by body change and perspective-taking, which will be evaluated both through the VR application and questionnaires after the VR intervention. Inclusion also constitutes a basic parameter of the VR tool, as inclusive education is a fundamental right and a key goal set by the European Union. Decision-making will force the trainees to reflect on their actions, maximizing their self-efficacy, while stress resistance will be addressed through a relaxation scene within the virtual world.

It should be noted that the results gathered by the survey and the focus groups could lead to a future initiative once the project reaches its end, to further develop the VR tool and enrich it with a database of scenarios that target multiple skills and competences.

6. Focus Group

Taking into account the competences that scored highest in the questionnaire conducted in the previous step of the project, the results of the focus groups, the tool to be customized, the technical limitations mostly related to the VR equipment, and also the ability to match the scenarios under development with the competences and skills to be evaluated during the VR intervention, the consortium decided to address the following competences in the project scenarios:

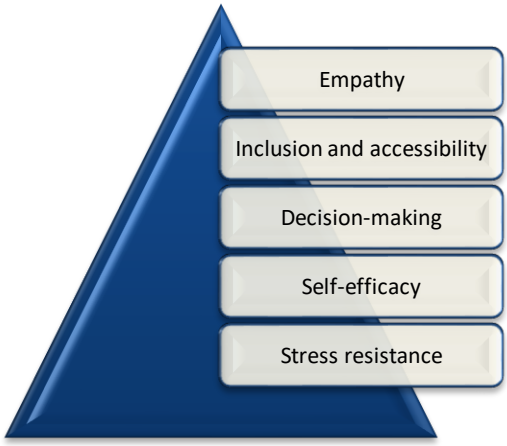

Figure 16. Soft Skills of the VRTEACHER Framework

In order to gain a deeper insight into the experience of the project's target group in these competences, the experiences in crisis situations such as the Covid pandemic, and to know more about the previous knowledge regarding Virtual Reality (VR) of the project's stakeholders, the project partners conducted 5 different focus groups.

During December 2021, 5 focus groups were carried out, one per partner country: Cyprus, Greece, Malta, Ireland, and Spain.

The focus groups were conducted online due to the restrictions that the pandemic situation required, except in Spain, where it was carried out in a hybrid way, with several participants in person and connecting with others online.

The focus groups involved a total of 25 participants with different profiles. Among them, there were university and college teachers, university students currently studying for an education degree, and PhD students. In addition, the focus groups included people with the profile of ICT experts.

The ages of the participants varied widely due to the different profiles. All of them were in the range of 18-70 years old. In terms of gender, among the 25 total participants, 13 were female and 12 were male.

The individual reports with the results of the Focus Groups conducted by each partner can be found in Annexes II-VI.

All focus groups initially began with how covid affected teaching and learning with having to deliver everything online. More precisely, participants were asked about a crisis management incident that took place during the pandemic and how they handled it. Participants agreed that the worst part at the time of disconnection from physical reality was the distance from students. They were immersed in a virtual environment based on video calls where some students and teachers encountered several barriers because they did not know what their role was in this new situation. According to the participants, the greatest difficulties with the students were breaking the barrier of the video-call type space and being able to work in dynamics that could be as similar as possible to a physical scenario.

At the level of work dynamics, they highlighted the need to change the focus of the work to the digital environment as the instructional design is different, the items are different and the time and the way in which the work has to be done from the teacher's position is different. In that sense, those who were lucky enough to have worked with digital competence have been able to do so, but many teachers have seen it as a big problem.

Regarding the video-call barriers, they mentioned the issue of activating the camera as a common problem. Some of the participants did not think that this was because the students had a problem setting it up, but because their learning environment and home space were not really prepared. However, it is a reality that having the cameras closed affected the lessons. Teachers/educators had no clue related to whether the students were listening. The participants argued that some of the students were just connecting to the lesson and then probably leaving the room because, at the end of the lesson, those students remained connected. As incidents, the participants reported that some of the students tried to interrupt the lessons by opening the microphone and playing music. Others pretended that the Internet connection had problems simulating noises to indicate that there were interruptions and some of them left the microphones opened being the rest of the class able to hear what was happening in the home of the other. Moreover, there was very limited interaction with the participants, making it quite challenging to achieve motivation and engagement.

What is more, teachers/ educators, faced serious challenges from their side. Their children sometimes interrupted the lessons, and in some situations, they even had to take a break to calm them down. Moreover, during the conversation, some of the participants mentioned that during face-to-face meetings they confronted cases of domestic violence.

This was followed by a discussion on empathy in the classroom and how both teachers and students felt it was addressed. Regarding this topic, all participants talked about the importance of having smaller ratios in the classroom, as nowadays classes are crowded, and it is very difficult for teachers to reach everyone. All participants agreed that social-emotional skills are fundamental, even more, important than other more countable or harder skills. However, when it comes to the ICT field, participants had different opinions about how to use technology for addressing empathy in the classrooms. While all the participants agreed that it was easier to understand when students were facing a problem during the face-to-face meetings, it was not as clear to identify these problems in the online environment. Some of

the participants argued that addressing empathy during online meetings was almost impossible because of the fact that during the online lessons the camera was closed, making it difficult to understand students' feelings as the teachers could not see their faces. However, some other partners, all from the ICT field, talked about how the use of technology allowed them to have a dynamic class in which the important things were not only given at the beginning and the end but had a progression. They worked in a more sequential way with different practices and dynamics that somehow required a relationship with the student. They commented that it was sometimes very difficult to have a relation with the learner when things happened from the expository part, in which the teachers expose their knowledge so that the students can take notes. In this case, the important things happen at the end in the form of exam-like tests to assess their whole process. However, activities such as the portfolio helped to collect students' knowledge throughout the semester, which could speak for them as evidence for the final assessment. Participants believe that this helps to strengthen the connection with the learner. However, they also think that this is a challenge because the ratios are still high and it is difficult to personalize learning, where everyone has their own space, and their own interests, and it is very complicated to approach it from that position.

Regarding the skills of inclusion, decision-making, stress resistance, self-efficacy, self-control, and assertiveness collected in the questionnaire, participants talked about their importance and about the training they had in implementing them in the classroom both as future teachers and in the role of current teachers.

Decision-making is certainly important in any kind of work. Knowing what decision to make and planning appropriately can help individuals manage their work as best as possible. This might not be about taking the best decision that will lead to guaranteed success. It might be about estimating the advantages and disadvantages of each option, benefits or risks, and selecting the option that better fits an individual personality or context. By taking appropriate decisions and knowing how to justify them, it is possible to achieve plenty of goals or skills, know what steps to take to achieve inclusion, reduce stress and increase self-control or efficacy, as any decision will be well justified and planned, and to be assertive and describe decisions appropriately.

Apart from the mentioned skills, other competences were also mentioned as interesting to develop self-efficacy, collaboration, critical thinking, and self-monitoring.

Regarding the training participants had in implementing these competences in the classroom, some participants stated that "pedagogy has evolved little, but the classroom structure has not improved at all, we are still the same as 40 years ago". They believe that there are still purely lecture classes where the teacher holds the information and distributes the knowledge to the students in a unidirectional way, even though this reality is not replicated outside the classroom. In the work environment, for example, there is no situation where someone talks and the rest listen. Participants think that teachers must consider that the classroom is dynamic and that the way of learning has to be different so that students can really learn. This is where other resources come in, such as assertiveness, the relationship between peers, and

other types of strategies that were previously not important for most teachers due to the difference in structure. According to some participants, practical activities should be implemented in pedagogical subjects to learn how to apply these soft skills in the classroom. When the structure of the classroom changes, teachers should take these soft skills to manage a classroom from a more personal side, because at the end of the day the final product that is being educated is a group of people.

Linked to this topic, they talked about how important it is to know the reality behind the students, about the importance of getting to know the students, which allows bringing activities closer to their reality and needs. They stressed that this is learned through continuous training. In addition, the participants highlighted a skill that has to do with being constantly open to learning: flexibility. Flexibility allows people to constantly evolve getting feedback from peers and students since every year they draw conclusions and incorporate them to try to be a better version the following year. This competence has to do with soft skills, with the socio-emotional skills that make the difference at the teaching level. Flexibility is the skill of the 21st century. The participants pointed out that we live in a society in which rigidity does not go down very well because we socialize in an uncertain way that changes at a very fast pace. They pointed out that people need to have a flexible mentality so that we can be able to change their way of thinking regarding the traditional way of teaching. Teachers need to let the students do it, they need to be able to accompany them and have alternative plans.

Taking this into consideration, education must be prepared for tomorrow's society and to provide the skills for the future and therefore, it must be as up-to-date as possible. Implementing new tools in the classroom, like Virtual Reality, is seen as a great possibility to attract and motivate students to study, due to their great involvement with the recreational activity outside the classroom. In addition, and as a final touch, the great possibility of living immersively in a parallel reality showing real situations can occur in the classroom to further strengthen the practical knowledge of future teachers and to reinforce the process of continuous training that was previously discussed in the Focus Group.

The definition of the key competences for class management in response to the COVID-19 pandemic will form the basis for the development of the pedagogical and competence VR training framework. This identification will allow the development of effective training scenarios that meet key and life competences that can be cultivated via VR-based approaches.

7. VRTEACHER Framework

Taking into account all the information obtained during the development process of this report, the project partners have made a selection of the skills to be addressed while working with the Virtual Reality tool. For the definition of the VRTEACHER competence framework, the partnership had to take into consideration, apart from the competences that scored the highest scores in the survey, the type of scenario for the customization of the VR application along with the limitations of VR technology and equipment. For this reason, the selection of the project's core competences was not made based only on the competences that scored higher in the survey, but based on the competences that could be addressed and reflected through the VR tool and scenario. VR technology offers a novel opportunity for practical training and could form a novel training paradigm in teacher education. However, educators are quite unfamiliar with this type of technology, while the main aim of the project is to promote the use of low-cost equipment easily accessible from schools, which defined the final selection of the VRTEACHER competence framework. The final selection of the key competences to be addressed through the VRTEACHER training tool can be summarized into the following:

Figure 17. Soft Skills of the VRTEACHER Framework

The existing Virtual Reality tool that will be customized for the needs of the project, takes into consideration all the results obtained in this framework, aiming to provide higher education students but also active teachers a novel experiential training approach, maximizing their practical experience and ability to cope with dynamically changing classrooms. The VR tool has the vision to replicate real-life situations that occur within a classroom, based on in-service teachers' experiences aiming to promote the exchange of best practices among teachers and to guide and support student-teachers with the challenges that they will normally experience during their Teaching Practice in a school. The added value of the VR tool lies in the fact the teacher training through Virtual Reality, takes advantage of the immersive

experience that this technology offers, and provides a safe space for training, experimentation, and learning from mistakes while minimizing the possibility of harming a real student.

The VR tool will be composed of different scenarios that will reflect everyday situations that can happen in the classroom related to crisis situations such as a pandemic. **Empathy** is one of the core competences of the project, and also a key element of the VR world. VR allows body and perspective change, making it a valuable tool for teachers by allowing them to change perspective and enter the shoes of their students. Within the virtual classroom environment, the user will have a global vision of the situations that will arise, and experience different points of view, like the role of teacher and student, maximizing his/her ability to understand different ways of experiencing a situation and, thus, making a more informed decision to solve the problem.

Accessibility and inclusion will be addressed in different ways in the scenarios. On the one hand, the scenarios will present a situation in which teaching is hybrid so that students are attending the class in a face-to-face format and others online. In this way, the teacher must know how to manage his or her teaching and how to include people who are not face-to-face in the group dynamics. On the other hand, from a wider perspective of inclusion, the characters will be designed according to the principles of diversity. The tool will give the user the possibility to choose the type of character they want to represent during the experience, having among them predefined characters that do not follow stereotypes, but are diverse people covering different races, genders, and disabilities.

Stress resistance is not an easily assessable competence, however, people who have been involved during the development of this project outcome have asked for it. To address this competence, a “Safe space” screen will be developed, allowing users to move there in case they feel overloaded and/or don’t know how to handle the situation at that moment.

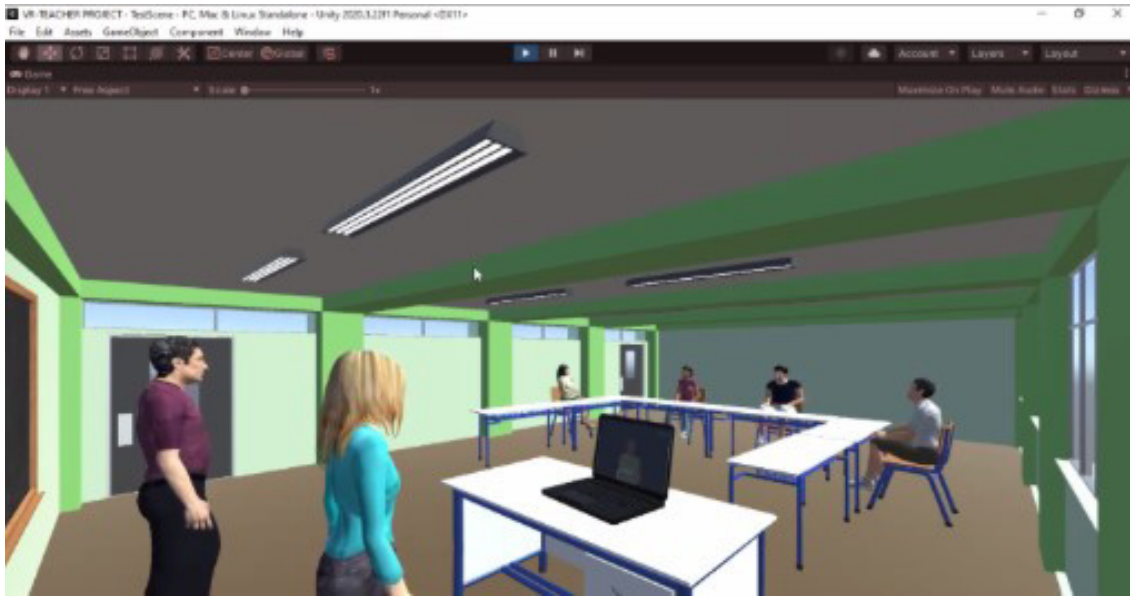

Figure 18. VR Scenario example

Regarding **Decision-Making**, the platform's scenarios will raise problematic situations that can happen in real life in the classroom, related to crisis situations such as a pandemic. Therefore, students immersed in them will be exposed to situations that they will have to solve by making their own decisions. The students will be asked to answer several questions with different possible solutions from which they will have to choose to solve the situation. The answers will not have a very obvious correct solution but will put the user in doubt forcing them to choose between different possible options. This situation will address not only decision-making but also **Self-efficacy** competence as the students using the tool will try to focus, as best as possible, on the objective of solving the situation and solving the problem as well as they can.

The VRTEACHER framework considered the main competences shown above for the design of the scenarios. However, those competences that scored higher in the questionnaire but were not the main ones selected by the project will be taken into account for future research and discussion.

Decisions about the customization of the tool are not finalized yet, so there may be changes in the development of the tool. The criteria of the customization will be assessed among all partners, contributing ideas to enrich the tool within its possibilities and preparing it for its introduction in teacher training classrooms in the next outputs of the VRTEACHER project.

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Annexes

Annex I: Teachers and Students Survey

Link to the Survey Monkey questionnaire:
https://www.surveymonkey.com/r/WRTeacherFramework

1st section: Personal Data

1. Country of residence: Spain, Greece, Ireland, Cyprus, Malta, Other
2. Sex: M / F / Rather not say
3. Profile: Teacher/Student

2nd section: General information depending on the profile:
General information for teachers:

4. Level you are teaching on: Primary / Secondary / Higher education / Other
5. On a scale of 1 to 6, during the Covid-19 lockdown, at what level did you have to integrate digital platforms/tools to deliver the virtual classes?
   (1 - no need to integrate any new tool, 2 – a reduced number of tools have been integrated, 3 – some new tools have been integrated, 4 – several new tools have been integrated, 5 – a wide range of new tools have been integrated and 6 - the way of giving the lessons have been drastically changed with the introduction of new tools)

6. On a scale of 1 to 6, how would you evaluate the training received in order to use new digital platforms/tools
   (1 - No training received, 2 – Some training received but not of sufficient quantity and quality, 3 – Training was good but I need more as a follow-up, 4 – Training was good and complete, 5 – Training was excellent but I still need a follow-up and 6 - Training was complete and I feel an expert)

7. On a scale of 1 to 6, how did you feel about changing the way you teach?
   (1 - not prepared at all, 2- with some preparation but I don't know how to integrate it in my lessons, 3 – slightly prepared, 4- prepared but not comfortable to face it by myself, 5 – prepared but uncertain about the management of the class and 6 - very well prepared and comfortable)

8. On a scale of 1 to 6, how comfortable did you feel about teaching using online platforms?
   (1 - not comfortable at all, 2 – not comfortable, 3 – slightly comfortable, 4 – comfortable, 5- very comfortable and 6 - extremely comfortable)

9. On a scale of 1 to 6, to what extend were the learning outcomes and objectives attained?

(1 - not attained at all, 2- very few learning outcomes and objectives were attained, 3 – a few learning outcomes and objectives were attained, 4 some learning outcomes and objectives were attained, 5 – a great number of learning outcomes and objectives were attained and 6 - all the learning outcomes and objectives were attained)

10. On a scale of 1 to 6, asses the level of the following potential problems:
    (1 – unimportant, 2 – slightly important, 3 – moderately important, 4- important, 5 – very important, 6 – extremely important)

    a. Self-regulation
    b. Attention
    c. Computer
    d. Internet access

11. On a scale of 1 to 6, how is the level of emotional and affective involvement in normal teaching activities?
    (1 – no at all involved, 2 – slightly involved, 3 – moderately involved, 4 – involved, 5 – very involved and 6 – highly involved)

12. On a scale of 1 to 6, how prepared do you feel to deal with emotional and affective issues that can arise in the classroom?
    (1 – no at all prepared, 2 – slightly prepared, 3 – moderately prepared, 4 – prepared, 5 – very prepared and 6 – highly prepared)

13. On a scale of 1 to 6, how prepared do you feel to address the emotional and affective involvement you get in face-to-face activities online?
    (1 – no at all prepared, 2 – slightly prepared, 3 – moderately prepared, 4 – prepared, 5 – very prepared and 6 – highly prepared)

14. On a scale of 1 to 6, how do you feel about receiving training to be prepared for similar situations such as Covid-19?
    (1 – not interested, 2 – slightly interested, 3 – moderately interested, 4 – interested, 5 – very interested and 6 – highly interested)

15. On a scale of 1 to 6, how laborious was your effort to adapt your educational materials to the new online format?
    (1 – not laborious at all, 2 – slightly laborious, 3 – moderately laborious, 4 – laborious, 5 – very laborious and 6 – highly laborious)

16. Did you carry out any online activity to promote the social and personal competences of your students?
    YES/NO If yes, please explain which one.

17. If YES, please explain which one.

18. On a scale of 1 to 6, how involved do you think you were in helping your students with the problems that may have arisen despite the distance and solve them?
    (1 – not involved, 2 – slightly involved, 3 – moderately involved, 4 – involved, 5 – very involved and 6 – highly involved)

19. In case of a similar situation in the future as the Covid-19 pandemic, is there anything that you would improve in your teaching? Why would you make these changes?

20. On a scale of 1 to 6, how experienced are you with Virtual Reality Technologies?
    (1 – not experienced, 2 – slightly experienced, 3 – moderately experienced, 4 – experienced, 5 – very experienced and 6 – highly experienced)

21. On a scale of 1 to 6, how useful do you think that Virtual Reality can be for teacher training?
    (1 – not useful, 2 – slightly useful, 3 – moderately useful, 4 – useful, 5 – very useful and 6 – highly useful)

General information for students:

22. Department you are enrolled: Education studies at university / Other

23. On a scale of 1 to 6, during the Covid-19 lockdown, at what level did you have to integrate digital platforms to receive the virtual classes?
    (1 - no need to integrate any new tool, 2 – a reduced number of tools have been integrated, 3 – some new tools have been integrated, 4 – several new tools have been integrated, 5 – a wide range of new tools have been integrated and 6 - the way of giving the lessons have been drastically changed with the introduction of new tools)

24. On a scale of 1 to 6, how would you evaluate the training received on using new digital platforms/tools
    (1 - No training received, 2 – Some training received but not of sufficient quantity and quality, 3 – Training was good but I need more as a follow-up, 4 – Training was good and complete, 5 – Training was excellent but I still need a follow-up and 6 - Training was complete and I feel an expert)

25. On a scale of 1 to 6, how did you feel about changing the way you learn?
    (1 - not prepared at all, 2- with some preparation but I don't know how to integrate it in my lessons, 3 – slightly prepared, 4- prepared but not comfortable to face it by myself, 5 – prepared but uncertain about the management of the class and 6 - very well prepared and comfortable)

26. On a scale of 1 to 6, how comfortable did you feel about taking classes on online platforms?
    (1 - not comfortable at all, 2 – not comfortable, 3 – slightly comfortable, 4 – comfortable, 5- very comfortable and 6 - extremely comfortable)

27. On a scale of 1 to 6, to what extend were the learning outcomes and objectives attained?
    (1 - not attained at all, 2- very few learning outcomes and objectives were attained, 3 – a few learning outcomes and objectives were attained, 4 some learning outcomes and objectives were attained, 5 – a great number of learning outcomes and objectives were attained and 6 - all the learning outcomes and objectives were attained)

28. On a scale of 1 to 6, asses the level of the following potential problems:
    (1 – unimportant, 2 – slightly important, 3 – moderately important, 4- important, 5 – very important, 6 – extremely important)

    a. Self-regulation
    b. Attention
    c. Computer
    d. Internet access

29. On a scale of 1 to 6, how is the level of emotional and affective involvement in normal teaching activities?
    (1 – no at all involved, 2 – slightly involved, 3 – moderately involved, 4 – involved, 5 – very involved and 6 – highly involved)

30. On a scale of 1 to 6, how prepared do you feel to deal with emotional and affective issues that can arise in the classroom?
    (1 – no at all prepared, 2 – slightly prepared, 3 – moderately prepared, 4 – prepared, 5 – very prepared and 6 – highly prepared)

31. On a scale of 1 to 6, how prepared do you feel to address the emotional and affective involvement you get in face-to-face activities online?
    (1 – no at all prepared, 2 – slightly prepared, 3 – moderately prepared, 4 – prepared, 5 – very prepared and 6 – highly prepared)

32. On a scale of 1 to 6, how do you feel about receiving training to be prepared for similar situations such as Covid-19?
    (1 – not interested, 2 – slightly interested, 3 – moderately interested, 4 – interested, 5 – very interested and 6 – highly interested)

33. On a scale of 1 to 6, how laborious was your effort to adapt your way of studying to the new online format?
    (1 – not laborious at all, 2 – slightly laborious, 3 – moderately laborious, 4 – laborious, 5 – very laborious and 6 – highly laborious)

34. Did you participate in any online activity to the empowerment of social and personal competences?

YES/NO If yes, please explain which one.

35. If YES, please explain which one.

36. On a scale of 1 to 6, how involved do you think you were in dealing with the problems that may have arisen despite the distance and solve them?
    (1 – not involved, 2 – slightly involved, 3 – moderately involved, 4 – involved, 5 – very involved and 6 – highly involved)

37. In case of a similar situation in the future as the Covid-19 pandemic, is there anything that you would improve regarding the delivery of eduaction?

38. On a scale of 1 to 6, how experienced are you with Virtual Reality Technologies?
    (1 – not experienced, 2 – slightly experienced, 3 – moderately experienced, 4 – experienced, 5 – very experienced and 6 – highly experienced)

39. On a scale of 1 to 6, how useful do you think that Virtual Reality can be for student training?
    (1 – not useful, 2 – slightly useful, 3 – moderately useful, 4 – useful, 5 – very useful and 6 – highly useful)

3rd section: VRTEACHER Project Framework

40. Assess the need to work on the following skills with your students. (With 1 being the lowest value and 6 being the highest.)

Digital Competence

	1	2	3	4	5	6
Accessibility &inclusion						
Differentation & personalisation						
Actively engaging learners						
Problem Solving						
Collaborative learning						
Self-regulated learning						
Guidance						
Teaching						
Assessment strategies						
Analysing evidence						
Application of Digital Skills						
Understanding ICT in Education						

41. Assess the need to work on the following skills with your students. (With 1 being the lowest value and 6 being the highest.)

Personal Competence

	1	2	3	4	5	6
Emotional control						
Stress Resistance						
Responsibility						
Persistence						
Self-Control						

42. Assess the need to work on the following skills with your students. (With 1 being the lowest value and 6 being the highest.)

Civic Competence

	1	2	3	4	5	6
Empathy						
Trust						
Co-operation						
Tolerance						
Assertiveness						
Sociability						
Social responsability and engagement						

Valuing of diversity						
Ethics						

4th section: Other Competences

43. Assess the need to work on the following skills with your students. (With 1 being the lowest value and 6 being the highest.)

Digital Competence

	1	2	3	4	5	6
Selecting						
Creating & Modifying						
Managing, protecting, sharing						
Content creation						
Responsible use						
Reflective practice						

44. Assess the need to work on the following skills with your students. (With 1 being the lowest value and 6 being the highest.)

Personal Competence

	1	2	3	4	5	6
Optimism						
Achievement Motivation						
Critical Thinking						
Meta-Cognition						
Self-Efficacy						
Adaptive and resilient						

45. Assess the need to work on the following skills with your students. (With 1 being the lowest value and 6 being the highest.)

Civic Competence

	1	2	3	4	5	6
Curiosity						
Creativity						
Energy						

Focus Group Report from Cyprus University of Technology

Focus Group Summary

The focus group in Cyprus took place on the 16th of December 2021 online and lasted approximately one hour. Four participants (active teachers, PhD candidates, students, and ICT experts) participated in the focus group. Two of the participants were teachers, one of the participants was an ICT expert and one PhD student. Delivering online was challenging for all the participants and the fact that the cameras were closed made the delivery of education more impersonal. The participants indicated that understanding their students during online lessons is quite difficult, and it is not possible to identify the problems that they face unless the students themselves approach them. The participants feel that empathy, stress management, and decision-making are key skills for every teacher, while we must refer to inclusion with a broad sense enclosing students that might not face a health disorder but could be refugees or facing a problem to join the rest of the group. For the active teachers, the virtual world should look like a real classroom setting and they would like the ability to choose their virtual character and the scenario case to be trained on.

Focus Group Development

Methodology

The focus group took place on the 16th of December 2021 online and lasted approximately one hour. The participants (active teachers, PhD candidates, students, and ICT experts) were invited through email and those who were available participated in the online meeting. Skype was used as the tool to conduct the focus group.

Participants

Four people participated in the focus group. Two of the participants were teachers, one of the participants was an ICT expert and one PhD student. The participants' age ranged between 25-44 years old. Three of them were female and one male. All of the participants had more than 4 years of working experience.

Discussion

Based on the online survey that took place in the previous months, a set of questions was identified and used to guide the focus groups. The questions used were the following:

- Share a crisis management incident that took place those two years of covid. How did they handle it?
- How teachers currently address empathy in the classroom?
- Which soft skills (inclusion, decision making, stress management, self-efficacy, self-control, assertiveness) would you be more interested in working on?
- Share your expectations regarding the virtual world (utility, design, categorization of the scenario to training cases)
- What kind of feedback do they expect to get during the interaction with the virtual world?
- What kind of feedback do they expect to get when the training finishes?
- If you were provided with a free VR training tool as part of the training methodology, would you use it?

The discussion initially began with how covid affected teaching and learning by having to deliver everything online. For the active teachers/educators delivering online was challenging and difficult to handle, mostly due to the fact the students had their cameras closed. According to one of the participants "*managing online lessons was difficult due to the fact that you had no eye contact with the students*". This fact affected the lessons, as teachers/educators had no clue related to whether the students are listening. The participants argued that some of the students were just connecting to the lesson and then probably leaving the room because at the end of the lesson those students did not terminate the meeting but remained connected. As incidents the participants reported that some of the students tried to interrupt the lesson, they open the microphone and start playing music, and others pretended that the internet connection had problems making noises to indicate that there are interruptions when the microphones were open the whole class could hear what was happening in the home of the other, limited interaction with the participants, while it was quite challenging to earn their motivation and engagement. Additionally, one of the participants reported that the majority of the participants were smoking, something that was not happening during the face-to-face lessons. As she mentioned, "*I was impressed that they smoked non-stop during the online lessons*".

What is more, teachers/ educators, faced serious challenges from their side, their children sometimes interrupted the lessons, and they had to take a break to calm down their child. Moreover, the participants reported that older teachers/ educators found it difficult to use online tools. The participants mentioned crisis that happened to them during face-to-face meetings in the past. One participant mentioned that during the lesson a student put the computer in the bag and just left knocking on the door. He then informed the teacher that he had a mental illness.

During the conversation, some of the participants mentioned that during face-to-face meetings they confronted cases of domestic violence. They either observed problematic behavior in the students or were informed by the school counsellor. Participants claimed that

the students particularly at a young age approach easier the teacher more to share things. "*Children are more spontaneous, adults think longer before they open to you*", said one of the participants. During this online era, this ability to understand such problems was impossible, while one of the participants mentioned that he received a lot of emails where some of the students claimed serious problems, however, the fact that you cannot have eye contact deprived you of the ability to understand if what is mentioned in the email is true. In case the participants had to confront a domestic violence case they would not take action initially, but they would close the lesson and then approach the student so as not to make the student a target for the rest of the classroom. "*Since the student is already feeling uncomfortable, exposing him / her more to the group may stigmatize him/her. So you close the lesson as if nothing happened and then approach the student. I would not feel comfortable handling it myself, maybe we (teachers) are not suitable*", said one of the participants.

According to the participants, it is difficult to address empathy. During the face-to-face meetings, they could understand the students facing a problem, it was easier to approach them and understand what they are facing and try to support the students either alone, or with the help of a school counsellor or family. Addressing empathy during online meetings is almost impossible. The fact that during the online lessons the camera is closed, you cannot see each other, you cannot see faces and understand that something might be wrong. According to the participants addressing empathy online requires an attempt from the students to come in touch with the teacher using an email, or chat or if you lose communication and active participation for a lot of days, indicating that there is a problem. One of the participants mentioned that she tried to get closer to the students through homework exercises, however, it was not easy to understand the student and a potential partner. The student-participant mentioned that she experienced a lot of support from her supervisor during the online lessons, as he was able to understand that she had family obligations, and a child at home during the lockdown. Nevertheless, one of the participants mentioned that only in the case of a small group, during which the cameras of the participants were open, they came closer to each other, and it was easier to enter the other person's position. Hence, open or closed cameras probably had a serious impact on the dynamic of the online lesson.

Regarding the most important soft skills to empower, all of the teachers stated that the most important ones are empathy and stress management. It is very difficult to manage their anxiety and do not know how someone could help them reduce it. One way to reduce anxiety according to one of the participants is to share it with someone. Decision-making also scored high, particularly during the covid era, along with self-efficacy, and self-control. One of the participants mentioned, "*the pandemic situation made us see that we are not robots, I will take part in the online lesson wearing my pajamas, and the baby might cry and I will have to interrupt the lesson ... at first, it bothered us but now it is part of everyday life*".

Inclusion according to one of the participants should not refer only to students facing illnesses like vision disorders, or autism but must be addressed in a more general way. Inclusion should

include cases like a foreign student or a student who cannot collaborate with the rest of the group. One of the teachers confronted an epileptic seizure by a girl during the lesson, he did not understand and did not know what to do. Some of the other students were aware of the problem and helped the girl with certain steps to overcome the seizure.

Regarding the design of the VR application, the participants mentioned that a relaxing scene for example a scene with the sea could help in stress management. The participants mentioned that the scene must represent something familiar to the users and also have sound. "*If they feel pressure in the virtual world it is nice to see a familiar real-life image*", said one of the participants. As far as the virtual classroom is concerned, the student participant would prefer a more imaginary virtual classroom, while active teachers would like to be trained in a classroom that looks like a real-life virtual classroom. "*If I enter a virtual classroom that is amazing (but not real-life based) it would alienate me. Yes it is a virtual world but it should remind you of school because it is for educational purposes*". One of the participants mentioned that the user must be able to choose his/her character. The VR application should provide the teacher-trainee with information about the virtual students.

The feedback that is provided by the VR application is extremely important for the trainee. A score at the end would not help. The participants would like the application to provide real-time feedback regarding each crisis that will take place and at the end of the application, they would like a checklist or tips based on the crisis that happened. Additionally, the participants would like to have the opportunity to have a menu of multiple scenarios from which they will be able to choose what their training is about.

The participants would like to use the VRTEACHER application and provide their feedback in the future.

Final Conclusions

The most important outcomes of the focus group can be summarized as the following:

- Delivering online was challenging for all the participants and the fact that the cameras were closed made the delivery of education more impersonal.
- Incidents during online lessons: students tried to interrupt the lesson, they open the microphone and start playing music, others pretended that the internet connection had problems making noises to indicate that there are interruptions when the microphones were open the whole class could hear what was happening in the home of the other, limited interaction with the participants.
- In case the participants had to confront a domestic violence case they would not take action initially, but they would close the lesson and then approach the student so as not to make the student a target for the rest of the classroom.
- Empathy, stress management and decision-making are key soft skills for a teacher.

- Inclusion must be addressed in a more general way and not only for cases of students facing a serious illness. Inclusion must also include students who find it difficult to cooperate with the rest of the class.
- A relaxing scene for example a scene with the sea could help in stress management. The scene must represent something familiar to the users and also have sound.
- Active teachers would like to be trained in a classroom that looks like a real-life virtual classroom.
- The trainees must be able to close from a list of scenarios the area that they want to train.
- The application should provide real-time feedback regarding each crisis that will take place and at the end of the application, they would like a checklist or tips based on the crisis that happened.

Focus Group Report from PANEPISTIMIO AIGAIOU

Focus Group Summary

The UAegean hosted a focus group with four participants, one undergraduate student, two teachers and one technology expert. UAegean originally intended to host the focus group face to face despite the geographical spread of the participants but following the risk assessment that focused on the COVID-19 pandemic, UAegean decided to host the focus group online (zoom platform). There were two facilitators present at the Focus Group session: one facilitator, Nancy Pyrini, moderated the session, ensuring all participants can have an equal say and share their opinions, while also asking questions and encouraging discussion; and the other facilitator, Dimitra Raiou took notes and documented the responses from all participants. Following the online meeting, the facilitators cooperated to collate and format into this reporting template what has been recorded and noted.

Focus Group Development

Methodology

Participants have been invited to the focus group via e-mail on November 29, 2021, and they immediately confirmed their interest and availability. The focus group has been held on the zoom platform on Tuesday, December the 7th 2021 at 18:00.

Participants

There were four participants:

- One female undergraduate student from the Department of Primary Education, School of Education Sciences, of the University of Ioannina; in the 18–24 age range; without work experience.
- One male teacher, with a BA in Elementary Education, a Master in Science Education, and a PhD from the University of Southampton; in the 40–50 age range; he has working experience in public schools, at the University of the Aegean and at the School of Pedagogical and Technological Education (ASPAITE).
- One male teacher, with a MA Degree in "Educational Sciences– Education with the use of New Media" and in-service specialization on Special Needs; in the 50–60 age range; he has working experience in public schools, as school principal, as teachers' trainer, and has served for three years at the Greek Consulate in Melbourne.
- One IT expert, studied at the University of Dundee Scotland BSc (Honrs), MSc, PhD.; in the 60-70 age range; he worked for ten years as a software engineer and consultant

in Greece before joining the University of the Aegean in which he is now Professor Emeritus and Scientific Responsible in many projects mainly funded by the European Commission.

Discussion

At the beginning of the session, the moderator played a three-minute video concerning the virtual application that formed the basis of the project and then a seven-minute video that clearly shows how VR is used for training purposes. The discussion followed around the following main questions:

- Share a crisis management incident that took place those two years of the pandemic. How did they handle it?
- How teachers currently address empathy in the classroom?
- Which soft skills (inclusion, decision making, stress management, self-efficacy, self-control, assertiveness) would you be more interested in working on?
- Share your expectations regarding the virtual world (utility, design, categorization of the scenario to training cases).
- What kind of feedback do they expect to get during the interaction with the virtual world?
- What kind of feedback do they expect to get when the training finishes?
- If you were provided with a free VR training tool as part of the training methodology, would you use it?

Some interesting quotes by the participants by questions follow:

Handling a crisis management incident

"In our school, there were certain occasions where particular students misused access to e-learning sessions by commenting in inappropriate ways or sending messages to students through the use of chat. Teachers restricted the use of the facility as soon as it was perceived.

Some parents were noticed actively supporting and criticizing, sometimes in inappropriate ways, their children during e-learning classes. They were notified that their presence was noticed and were asked politely not to interfere again in any way.

Sometimes accidents happened as non-appropriate dressing or discussing family or business matters over the phone interfered with the e-learning process."

"At the beginning of the pandemic the operation of the University had to comply with the state legislation issued for the occasion according to the measures taken.

Most of the students were at home in other parts of Greece and worked using the available tools: videoconferencing and Moodle LMS. The lectures were delivered in a synchronous mode according to the regular daily programme. In my subjects, we had one or two preliminary sessions (sort of lectures) to straighten any technical difficulties. Also, before each lesson, there was some time for solving technical problems. Lectures were taught by the Professor with the aid of a PhD student that was information technology expert. The chat was used as a channel for questions from the students so that they did not interrupt the flow of the lecture. The questions were answered either using chat or via audio to give everybody a useful piece of information. One characteristic of the effort is: From the participants list the teacher could see the names of the students so that he could answer or comment in a more personal and informal manner. In-person this was impossible with a few exceptions. Using chat sometimes other students offered to advise their colleagues that they were asking questions or having problems. The lecturer and the assistant made personal comments to chat or in audio to avoid disruptions as students could be doing something else on their screen - a common practice.

Altogether, the evaluation of the method, apart from obvious problems, offered distance learning a boost as a teaching tool by the educational community and it gave students a better view of the capabilities of the new tool."

Addressing empathy in the classroom

"Empathy is defined as "participation in the emotional experience of another ', that is, the ability to be able to find yourself in the place of another person and share his feelings and emotion. The ability to empathize is an important part of social and emotional development, affecting an individual's behavior toward others and the quality of social relationships.

In Greek schools, the utilization of theatrical techniques and animation in the school environment (Theatrical Education - Θεατρική Αγωγή), can cultivate a wide range of social and emotional skills, including empathy. Theatrical techniques offer children the opportunity to 'Experience' situations by 'getting in' the role position and dealing with various problematic situations.

Also, literature, taught in all school years, has the capacity to transport students into another character's mind, allowing them to see and feel what they do. This can expose them to critical life circumstances that are very different from their own. Through fiction, they can experience the world as another gender, ethnicity, culture, sexuality, profession or age. Words on a page can introduce them to what it's like to lose a child, be swept up in a war, be born into poverty, or leave home and immigrate to a new country. And taken together, this can influence how they relate to others in the real world."

Soft skills of interest

"I would be interested in practising more self-efficacy because I would like to improve the organization of activities during the teaching but also to understand if I managed to get the children to consolidate the topic we are dealing with."

Collaboration

In the late years of Primary School is often the first time a person is asked to work in a group on a project or presentation, and the experience can be genuinely formative. In group work, students naturally sort themselves out — leaders emerge while the less-engaged fade into the background — and discover their strengths and weaknesses as they pertain to working with others. The ability to collaborate and be a team player is crucial in the modern era, so it's definitely a skill to master.

Critical Thinking

The earliest instances of critical thinking tend to happen in the pre-teenage years, and it's important that parents and teachers foster them. This skill is all about having the ability to question oneself and others, and to understand that not everything is as it looks or seems. Critical thinking is thought to help students better navigate their entire lives.

Self–Monitoring

Self-monitoring refers to one's ability to measure and compare certain behaviors against a standard and then make efforts to change or control the self. It also refers to how well an individual adapts to social situations. In other words, it involves being self-aware and having the desire to constantly self-improve and meet the social needs of the situation. The ability to self-assess one's own behavior and approach it with critical thinking can help build leadership, social skills, emotional regulation, and adaptability.

Inclusion, decision-making, stress management, self-efficacy, self-control, assertiveness are soft skills interrelated between them. Selecting the ones that are most important can rely on interwoven factors such as the context, the priorities of a certain person and the nature of their work or a specific, individual task.

Decision-making is certainly important in any kind of work. Knowing what decision to make and planning appropriately can help individuals manage their work as best as possible. This might not be about taking the excellent decision that will lead to guaranteed success. It might be about estimating the advantages and disadvantages of each option, benefits or risks and selecting the option that fits more in an individual personality or context. By taking

appropriate decisions and knowing how to justify them, it is possible to achieve plenty of goals or skills. It is possible to know what steps to take to achieve inclusion. It is possible to reduce stress and increase self-control or efficacy, as any decision will be well justified and planned. It is also possible to be assertive; it is possible to describe decisions appropriately.

ICT and virtual reality can assist decision-making with appropriate software and simulations.

Expectations regarding the virtual world

"I believe that the virtual world will help to train new recruits in a job. Through virtual reality, employees will be confronted with many situations, which can sometimes be dangerous. A person learns better through realistic situations in the world he lives in than when he reads and memorizes information from a piece of paper."

"Virtual worlds are rapidly becoming part of the educational technology landscape. They offer a tremendous opportunity to provide a space for constructivist learning at its best and to enhance learning outcomes beyond that provided by traditionally designed CML courses.

In order to take full advantage of the mediums potential we must ensure that our students' VR experience are laid out properly to create a strong foundation for their virtual learning journey.

VR gets learners closer to reality than any other training medium, with less risk and expense. Immersive Learning scenarios should offers soft skills training that allows learners to have experiences and explore real-world emotional responses, and the opportunity to reflect on and assess their own performance."

"By engaging with virtual reality, it is possible to increase the quality of work. It can help teaching and experimenting with context that can otherwise be difficult to work on, with actual objects. For example, in science, it might be possible to examine cases such as a nuclear reaction and the microworld. That's not to say, though that there are no challenges.

With regards to utility, it would be convenient if any application or software was relevant to the topics and the goals that curricula, syllabi or course programs set. This will motivate educators to consider their use and implementation.

With regards to design, it would be convenient if they were provided at minimal cost and easy-to-run and work with by equipment available in school classroom without major technical requirements.

Categorization can depend on topics taught, or skills promoted. For example, there may be categories regarding the environment, electromagenitsm and any other topic. There might also be categories regarding decision-making, experimentation or data collection."

"The design of new educational products will depend (as always) on the intuition of the developers to match the needs of the educational community. … The scenarios will be within the range of observation and interaction of students with the technical, physical and fantasy worlds for deep understanding of their functions. The interaction parameter offered in VR and VR is of great importance since learning by doing is more effective after Dale."

Expected feedback during the interaction with the virtual world

"During the interaction with the virtual world, the trainee must get constantly feedback. Every person must know which moves are right and which are wrong. Also, the trainee needs to know what decisions he made that ultimately led to the right path."

"Providing personalized feedback is of the utmost importance in skills-based training, however using peer-to-peer feedback with a checklist is a very good idea.

Feedback is a tricky thing to provide in a virtual environment. It does lose some of the personal touch when you aren't able to assess body language as part of the delivery. That being said, arranging for peer-to-peer feedback is just as important if there is a performance-based application that is the outcome. They should hear the strengths and areas of improvement from those working in the same field. They should also get written or verbal feedback from the facilitator to drive home the takeaway."

"Feedback should depend on the goals of the interaction. In the field of education, the main goal has to do with learning. Therefore, any interaction with the virtual world and implementation of virtual reality applications in the teaching process should be evaluated under the criterion of teaching outcomes. In other words, it would be necessary to see if this application helped learning. This point, certainly, has plenty of dimensions to take into consideration.

Firstly, it has to do with learning about virtual reality and the appropriate feedback. It should be evaluated whether the learners have gained knowledge and skills regarding virtual reality.

Secondly, it has to do with learning other topics. For example, if the lesson focuses on environmental issues, it should be evaluated if the application of virtual reality helped that.

Thirdly, it should be evaluated if its' use was convenient for the teacher and the learners as well."

Expected feedback when the training finishes

"A final evaluation of the trainee should be made after the end of the virtual practice. The practitioner needs to be aware of his mistakes during the interaction with the virtual world, in

order to further improve in this situation and find other alternatives. In addition, the correct answers must be given so that they know exactly how to deal with this situation correctly."

" 1) The effectiveness of the virtual reality training.

2) The transferability of training effects into the real world.

3) How much has this VR technology contributed to the effective immersion of training teachers in a real critical life situation and helped them to find optimal pedagogical solutions.

4) Has it helped increase their self-confidence due to their inexperience in handling conflict situations that require quick and immediate solutions."

"Training is necessary for all professionals. Training is generally expected to provide professionals with knowledge about how to apply, implement and resolve practical issues regarding their everyday life and work. In that respect, it should focus on practical information. In doing so, training might need to address theoretical parts in relation to the practical aspect.

Any training provided for teachers around virtual reality should emphasize how teachers can use virtual reality, what goals they can achieve, what challenges might arise and how to deal with them. In other words, the training should pay attention to what is virtual reality and how it can be used for teaching purposes to guarantee the best learning outcomes.

Feedback will be provided in that respect. There are two dimensions of this feedback. The first is about virtual reality and whether teachers have learned about it. The second is its' teaching potential and if teachers have learnt how to use it in the classroom."

" The degree they liked/enjoyed the training

The emotions they had from the experience

The quality of the learning outcome

Their remarks on the method used

Their remarks on the use of equipment

Possible problems or difficulties they did have

In case they experienced more than one scenario which one they understood better and why"

Potential of use of a free VR training tool as part of the training methodology

"Of course, I would use it. I believe that this is a great opportunity to receive training in the educational field. I have learned and studied those situations theoretically, although, when

we go to the practical part, things are completely different. I believe it would be perfect to train in a virtual world, where you can experiment without fear of the consequences of your actions."

"Virtual reality is gaining a raising focus in plenty of aspects of contemporary world. The field of education is no exception. There is interest in learning how to use virtual reality for education purposes.

Any opportunity to come in touch with virtual reality and its applications is beneficial for educators. There are numerous applications providing a variety of functions and advantages for the educator. That is to say that every application of virtual reality, as with every application of ICT generally, can be used for different and specific purposes. Learning all applications might be out of the question. However, by engaging with a certain application it is possible for a teacher or a professional to understand generally how all applications work.

In short, provision of a virtual reality training tool, as part of a seminar or any occasion of training methodology should be considered a unique opportunity. This tool is highly likely to be useful."

Final Conclusions

Recommendations and conclusions that came up in the focus group follow:

R1: Soft skills that have been recorded as most interesting are: self-efficacy, collaboration, critical thinking, self-monitoring and decision-making.

R2: The training in the immersive environment must provide real-time feedback for trainees and allow them to change their decisions and actions to observe the consequences.

R3: The scenarios must react to a multitude of inputs and trainee actions.

R4: According to the high expectations that have been recorded as regards the feedback when the training finishes, the development team must use the objectives set before building the scenario, including the project KPIs and define "success" and "failure" (this can vary between the scenarios). Trainees must receive a detailed analysis of their assessment in the virtual world that will be useful for their work in the real world.

Focus Group Report from Fundación Siglo22

Focus Group Summary

The Focus Group of the VRTeacher project in Spain carried out by Fundación Siglo22 took place at the Universidad Autónoma de Madrid on 13 December 2021 with a total of 8 participants. Among the participants, we highlight the attendance of 3 students, 4 teachers within the ICT area and an expert in new technologies. In order to proceed with the discussion, the questions previously set by the project consortium were taken into account. These questions were on the one hand related to the experience of the participants during the pandemic and, on the other hand, to the virtual reality tool that is being developed to support teacher training. Regarding the first part, all the participants highlighted the same problems, such as the distance from the student, the need to adapt the training dynamics to the virtual environment, the lack of training of teachers in the development of soft skills with their students and the importance of continuous training for the learning of these skills. As for the second, the participants watched a video explaining the tool in order to be able to situate themselves in the discussion and then gave their opinions on how the tool should work in order to make it as accessible and attractive as possible.

Focus Group Development

Methodology

The Focus Group in Spain was held by Fundación Siglo22 in the Universidad Autónoma de Madrid facilities on the 13th of December 2021 at 13:00 CET.

The methodology used was a hybrid event, in which 4 of the participants and the Siglo22 staff met face-to-face and connect with the other 3 participants via Zoom.

Participants

In total, the Focus Group in Spain had 8 participants. 3 of them were students with educational degrees age between 18 and 24 years old. All of them are students at Universidad Autónoma de Madrid women.

One has experience in coordinating extracurricular activities. The second one has experience in private classes and internships in Primary and Infant education. The third one has experience in dance teacher and private classes.

Regarding the university teachers, two of them are between 25 and 34 years old, and the other two are between 45 and 64. All of them are teaching future teachers with educational degrees and master's degrees in education and they are all men. They belong to different universities, such as UAM, Nebrija University and Rey Juan Carlos university. All of them have experience in teaching both primary/secondary education and high education. Also, they are all familiarized with ICT and innovation in teaching.

Finally, the ICT expert is between 55 and 64 years old and has worked for several years as an expert in ICT, offering support and collaborating in innovative projects using Web technologies and LMS platforms.

Discussion

With regard to the question about the major difficulties in times of the Covid 19 pandemic, the group of participants agreed that the worst part at the time of disconnection from physical reality was the distance from the student. They were immersed in a virtual environment based on video calls where students and teachers encountered barriers because they did not know what their role was in this new situation. According to the participants, the greatest difficulties with the students were breaking the barrier of the video-call type space and being able to work in dynamics that could be as similar as possible to a physical scenario. Among these barriers, they mention the issue of activating the camera as a common problem, but they did not think that this was because the students had a problem in setting it up, but because their learning environment and home space were not really prepared. At the level of work dynamics, they highlighted the need to change the focus of the work to the digital environment as the instructional design is different, the items are different and the time and the way in which the work has to be done from the teacher's position is different. In that sense, those who were lucky enough to have worked with digital competence have been able to do so, but many teachers have seen it as a big problem.

This was followed by a discussion on empathy in the classroom and how both teachers and students felt it was addressed. Regarding this topic, all participants talked about the importance of having smaller ratios in the classroom, as nowadays classes are full of many students and it is very difficult for teachers to reach everyone. All participants agreed that social-emotional skills are fundamental, even more important than other more countable or harder skills. The teachers who attended the Focus Group, all from the ICT field, talked about how the use of technology allows them to have a class dynamic in which the important things are not only given at the beginning and at the end but have a progression. They work in a more sequential way with different practices and dynamics that somehow by their very nature mean that there has to be that link with the learner. They comment that it is sometimes very difficult to link with the learner when things happen a lot from the expository part, in which a person as a teacher comes to class and what they do is expose their

knowledge so that the students can take notes. In this case, the important things happen at the end in the form of exam-like tests to assess their whole process. For participants, putting social-emotional skills into practice through technology is easier because activities such as the portfolio help to collect students' knowledge throughout the semester, which can speak for them as evidence for the final assessment. The participants think that this helps the connection with the learner to be stronger. However, they also think that this is a challenge because the ratios are still high and it is difficult to personalise learning, where everyone has their own pace, their own interests, and it is very complicated to approach it from that position.

Regarding the skills of inclusion, decision-making, stress management, self-efficacy, self-control, assertiveness collected in the questionnaire, the participants talked about the training they had in implementing them in the classroom both as future teachers and in the role of current teachers.

The students who took part in the discussion said that their training was more based on their (short) experience in the classroom than on having learnt it at university. According to them, although there are subjects on values or psychology in the teaching degree, they have not seen its practical application that could be useful for them to use it in their future teaching practice.

Current teachers added information along the same lines. According to them, pedagogy has evolved little but the classroom structure has not improved at all, we are still the same as 40 years ago. We still have purely lecture classes where the teacher holds the information and distributes the knowledge to the students in a unidirectional way. However, this reality is not replicated outside the classroom. In the work environment, we do not have this situation where someone talks and the rest listen. They think that we have to take into account that this classroom dynamic, this way of learning, has to be different so that students can really learn. This is where other resources come in, such as assertiveness, the relationship between equals and other types of strategies that were previously not important for most teachers due to the difference in structure. According to one of the participants, practical activities should be implemented in pedagogical subjects to learn how to apply these softer skills in the classroom. When the structure of the classroom changes, teachers should take these soft skills to manage a classroom from a more personal side, because at the end of the day the final product that is being educated is a group of people.

Linked to this topic, they talked about how important it is to know the reality behind the students, about the importance of getting to know the students in order to bring activities closer to their reality and needs. They stressed that this is learned through continuous training. In addition, the participants highlighted a skill that has to do with being constantly open to learning, which allows people to be in constant evolution both among peers and students, since every year they draw conclusions and incorporate them to try to be a better version the following year. This skill is flexibility. This competence has to do with soft skills,

with the socio-emotional skills that make the difference at the teaching level. Flexibility is the skill of the 21st century. The participants pointed out that we live in a society in which rigidity does not go down very well because we are in a society of uncertainty that changes at a very fast pace. They pointed out that people need to have a flexible mentality which we can be able to change their way of thinking in which if teachers do not give them all the theories planned for that day they have failed to meet the objectives. Teachers need to let the students do what they do, they need to be able to accompany them and have plans B, C and D.

Subsequently, the focus was changed to focus more on Virtual Reality. Before watching the video selected for the Focus Group, participants were asked what they expected from the Virtual Reality tool as a resource for teacher learning. Only one of the Focus Group participants had not had any experience of this type. Among the rest of the participants, their opinions were diverse, but the most predominant was the idea of all the students being at home with VR goggles on, being able to be virtually connected to a face-to-face type of class. In addition, there were also uses of Virtual Reality in a more expository way in which students can immerse themselves in places that are difficult to access in a normal classroom. Everyone spoke of the positive possibilities of such an immersive experience as that provided by virtual reality glasses.

After watching the video of the tool, the need to design classrooms that break with the traditional image of the classroom in which the teacher stands in front of a row of chairs where the students sit to listen to the information was discussed. Such innovative tools can be used to promote a new way of working that provides a more activity-driven education and new approaches, such as those outlined earlier in this discussion. Scenarios that are designed in a way that allows for the development of the aforementioned soft skills.

On the other hand, the importance of remaining at all times on the screen where the interaction with the activities and thoughts during the training is taking place was discussed, so as not to decontextualise the environment. Also, the possibility of being able to see the consequences of all possible actions before deciding which option to take was discussed.

Finally, the use of this type of tools in the classroom was highlighted, as education must be prepared for today's society in skills for the future and therefore must be as up-to-date as possible. Implementing this type of tools in the classroom is seen as a great possibility to attract and motivate students to study, due to their great involvement with the recreational activity outside the classroom. In addition, and as a final touch, the great possibility of living immersively in a parallel reality showing real situations can occur in the classroom to further strengthen the practical knowledge of future teachers and to reinforce the process of continuous training that was previously discussed in the Focus Group.

Final Conclusions

- The worst part at the time of disconnection from physical reality was the distance from the student.
- It is needed to change the focus of the work to the digital environment as the instructional design is different, the items are different and the time and the way in which the work must be done from the teacher's position is different.
- Social-emotional skills are fundamental, even more, important than other more countable or harder skills.
- For developing soft skills, it is important to have smaller ratios in the classroom, as nowadays classes are full of many students and it is very difficult for teachers to reach everyone.
- Importance of changing the traditional way of teaching. Not expository where the teacher shares information with students, but more participatory al progressive, where students can show evidence of their evolution through the whole process.
- Pedagogy has evolved little, but the classroom structure has not improved at all, we are still the same as 40 years ago.
- Practical activities should be implemented in pedagogical subjects to learn how to apply these softer skills in the classroom. When the structure of the classroom changes, teachers should take the soft skills to manage a classroom from a more personal side, because at the end of the day the final product that is being educated is a group of people.
- Flexibility is the skill of the 21st century.
- Importance of remaining at all times on the screen (with the VR tool) where the interaction with the activities and thoughts during the training is taking place.
- Possibility of being able to see the consequences of all possible actions before deciding which option to take.
- Education must be prepared for today's society in skills for the future and therefore must be as up-to-date as possible.

Focus Group Report from FUTURE IN PERSPECTIVE LIMITED

Focus Group Summary

The goal of this focus group is to gather ideas directly from the group regarding the impact of the VR teacher training tool and the best practices guideline handbook that will summarize the methodology and implementation of innovative VR-based approaches in teacher education. This will provide the project with qualitative data from the project beneficiaries' perspective.

In addition, since focus groups encourage interaction among participants and aremoderated by at least one person, it is an adapted way to reach out to groups of all ages, especially educators.

Participants will be asked to consider what crisis management incident may havetaken place over the Covid-19 period and how did they overcome that. The discussion will include the topic of soft skills and their expectation of the Virtual Reality world. The key objective for this focus group is to examine, if the target group were provided with a VR training tool as part of the training methodology would they use it.

Focus Group Development

Methodology

The VR Teacher focus group meeting took place online on Friday, 10th December2021. Our initial plan was to host this focus group in person at Ratoath Community School on Tuesday, 7th December; however, due to Storm Barra, Ratoath School was closed for the day, and they were not able to facilitate us tohost this focus group in person before the end of December:

Therefore, Future in Perspective reached out to our extensive network of educators and students to arrange an online focus group session, to ensure thatwe could complete this session and support the research process in IO1. To prepare participants, we invited them by email, shared the short video with themand asked them to complete the SurveyMonkey questionnaire to register their participation in this focus group session. The focus group was then hosted on Friday, 10th December between 10.00 am and 12.00 pm.

To commence this online session, the group were given an outline of the project including the following:

Description of project and project partners

- Aims and objectives
- Proposed outcomes
- Target group's expected involvement
- Website and Facebook page

Participants

Age: 20-60 years of age

Gender: 3 women and 2 men

Profile and work experience:

- Teacher 1- Biology teacher and over 20 years of experience
- Teacher 2- Social science teacher- 7 years of experience
- Technical expert 1- Software development- 4 years of experience
- Technical expert 2- IT development- 5 years of experience
- Student- Studying at Dundalk Institute of technology for 2 years

Discussion

Each member of the group then introduced themselves and gave an account of their background and experiences in the education system and their previous involvement with VR education. The facilitator posed the question of how they found their experience with Covid-19 and what crisis management incident; s did they encounter.

Teachers 1 & 2 discussed how in schools before the availability of the Vaccine the Government opted to close the school and for the teaching to go online. In the early days, there was a lot of uncertainty about the infectivity rate of the virusand how likely it was to be transmitted in the school and then into the wider community. At this time there were heightened levels of tension and the school had to show leadership to the young students and their families. This, therefore, puts a spotlight and pressure on teachers and principals almost beyond their training. Despite all this, they handled this increase in pressure in extraordinary circumstances very efficiently. The technical experts pointed out that there wereissues where the users

could not access the resources needed to complete theirwork but some skilful planning and fast responses helped to minimize the amount of time that this took place. The student commented on how difficult it was to overcome the barrier of not engaging with other students and having to be at home all the time.

The teachers then discussed empathy within the classroom and due to increasednumbers in the classroom and the demand for exams and addition to thecurriculums, there is little time or space to make sure that the teacher is connecting with the students with empathy. A teacher would have to make a conscious effort and plan to reach out to all the students in their classrooms. Thismay or may not be of interest to teachers who only see their role as providing information and teaching materials. It was agreed that the need for empathy towards students needs to be increased due to the increasing levels of mental health issues in young people. All participants agreed with this.

Participants then discussed which soft skills they would like to improve. Self-control and decision-making skills were the ones predominately chosen by the group to improve. The student agreed that for educators these were important skills to have.

The teachers spoke about how VR would be a huge benefit to the current Irish Curriculum. The possibility of providing equipment to support those learners thatlearn better visually instead of using textbook material would be very beneficial. Both technical participants and students agreed that the possibilities are endlesswith VR. The usefulness of being able to showcase possible real-world scenariosis amazing and would be a great learning tool to better understand what to do inthe classroom.

All participants discussed the feedback of using VR including; the virtual world would feel surreal for students at first but when the learner engages fully in theenvironment it would make a massive impact. Student commented-During the interaction with the virtual world, you would expect positive feedback, as you would be more involved in the subject because you can be "immersed" in a totallydifferent world.

It was clearly evident that all participants were excited by the use of VR in education and could see huge benefits of using this for certain topics.

One commented that they “would like to use it because I feel that it would improve our decision-making capabilities when dealing with unfortunate or crisisscenarios.

Following this, participants were given the opportunity to ask questions about theproject and their involvement in the focus group. Participants were asked to complete a profile form on themselves and agreed to establish a group email to arrange further meetings or distribute project information.

Final Conclusions

Overall, the feedback from the participants was very positive in terms of the VR teacher training tool and the best practices guideline handbook. They all agreedthat the possibility for

students to learn through this platform is endless and that potentially testing this in Irish schools would be of huge benefit. The VR teacher platform is very useful tool for students and teachers to use. The group concludedthat they would like to see this become part of the Irish education system to ensure all types of learners' needs are met within the classroom. They also agreedthat all teachers would require extensive training in this to upskill to understand the use of VR and how to best use it for it to be successful. Another recommendation included: “in future, I would hope VR can continue to grow withthe use through emergency service and construction training as well as be implemented as a key daily piece of equipment to advance and benefit the workers. I would also like to see certificates given out for completing these VR training courses to increase their reputation and benefit the worker who completed it”.

Focus Group Report from THE COMMONWEALTH CENTRE FOR CONNECTED LEARNING FOUNDATION

Focus Group Summary

The focus group was held online on Thursday the 30th of December 2021.

The four participants were three females and one male, all working or studying in the educational field, especially educational technology, educational psychology, and learning support.

The participants were very well prepared on the topics and answered the questions to the best of their abilities. However, some interesting ideas and experiences came out during the discussion rather than the individual replies to each question. The debate was intense, and participants felt free to agree or disagree with ideas. Often the participants added their own views and experiences to the ideas already expressed.

Focus Group Development

Methodology

The focus group was held on Thursday the 30th of December 2021, the first available opportunity for all four participants and the moderator given it was Christmas time and there were the usual disruptions with Covid-19. The event was held online via Microsoft Teams. The participants were all briefed about the objectives of the focus group online days before the event. They were also given an idea of the questions and were instructed on the conduct of the discussion.

Participants

The four participants, all volunteers, were three females and one male. One is a university professor in educational technology, another is a full-time educator in a secondary school doing a doctorate in education and psychology, one is a learning support coach for students with learning difficulties in higher education, and the fourth one is a learning support coach forstudents with learning difficulties in higher education but also doing a bachelor's degree in education.

Discussion

The participants were asked each question individually first and then there was a limited open discussion on the topic of each question.

Though the participants all agreed that there are many benefits to online learning, there is onemajor challenge, and this is the fact that there is an absence of or insufficient eye contact and non-verbal communication. Students have suffered from mental health and learning difficulties during the pandemic when they were forced to go exclusively online almost overnight, and students with learning disabilities suffered more. When these went back to school they were overwhelmed by the physical experience and had to re-acclimatize themselves again since a change in routine affects their performance. These students prefer tosee a demonstration live in a physical setting rather than follow it online and the experience is totally different. This must be considered when looking at the affordances of VR in education.

Regarding empathy, there was a consensus that this is crucial in an educational setting, but this sometimes is lacking both among the students themselves and between the students and their educators. Participants also noted that some educators lack enough empathy towards their students, but these are in a minority. The absence of body language affects empathy negatively. Some students resist engagement online as they prefer physical engagement, but on the other hand, there are students who are too shy to speak in a physical setting but are more willing to interact online. From an educator's point of view, for engagement to happen in an online class it needs a lot of planning and preparation on their part, and it is time-consuming. Different age groups of learners need different levels and types of empathy.

In response to the question about the most important soft skills, the most voted were stress management, assertiveness, and inclusion (especially the difference between equity and equality).

The expectations from VR are realistic, especially from the two participants who have some experience with VR and educational technology. The other two participants are looking forward to having VR in their classrooms and made available to their students as they think it is complementary to the physical educational experience, especially in Vocational and Educational Training (VET) subjects. The most sought-after affordance is interactivity, where the user has a degree of control and is actively taking part in the experience. VR can provide simulations or experiences that are not easy to have in class or are impossible to do in real life. The participants remarked that they would like educational VR to be customisable by educators and for the software/ service (not the hardware) to be made available to them and the learners at a low cost or free of charge.

The participants all emphasised the need for feedback for educators, but this must come both during the experience and after the experience is completed. It would be ideal if the feedback system is integrated with the VR app and educators can change the feedback on the

educationalmetrics as they need to assess the different skills of different students. This will facilitate the extremely important transfer of learning from VR to real life.

Students need to have access to the VR experience at home and after school, hours to study and revise. However, the participants recognised there are issues with the cost and availabilityof technology, even if access to VR technology is now more affordable than just a few years ago.

Some participants suggested the addition of Augmented Reality (AR) to VR because they complement each other. AR can be used in real-life settings such as schools and other places. AR can support assessment, and individualisation of learning and make administration work easier.Another approach that was mentioned is gamification, where the VR experience is transformed into a game, and this may attract more attention from learners.

Finally, all participants expressed their agreement to take part in training on VR when provided by the VR Teacher Project.

Final Conclusions

Several points were made in the discussion but to summarise:

- Online learning has many benefits, but the limited/lack of eye contact and non-verbal communication are major issues, especially with students who have learning disabilities.
- Empathy is crucial in education, but this is harder to achieve in an online learning experience.
- VR has strong potential for education, but it has its limitations (cost, access).
- User interactivity with VR is extremely important.
- The educator needs feedback from VR experience during and after the experience.
- VR could be supplemented by AR.
- The Gamification of VR has strong potential in education.