COViR Teachers' Guide

This document contains Teacher Training Materials from the COViR Project co-funded by the European Union under the Erasmus+ programme

Scientific editorial:

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EdiTC EDUCATION & INFORMATION TECHNOLOGY CENTRE

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ΕΣΕΕ ΕΛΛΗΝΙΚΗ ΣΥΝΟΜΟΣΠΟΝΔΙΑ ΕΜΠΟΡΙΟΥ & ΕΠΙΧΕΙΡΗΜΑΤΙΚΟΤΗΤΑΣ

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CYPRUS CERTIFICATION COMPANY

FUNDACIÓN **equipo humano**
INNOVATIVE ACTIONS FOR A PEOPLE-CENTRED EUROPE

Radom, April 2023

Title: COViR Teachers' Guide

Key words: virtual reality, continuing education of adults, competency

Abstract:

The COVID-19 pandemic brought many challenges with which people had to deal in all areas of personal and social life and which led to dynamic technological and organisational changes. One of the sectors that had to face many new problems was education, where many teachers were thrown in at the deep end without any further preparation to teach students online. The desk research conducted for the purpose of our project has shown that there are no VR trainings dedicated to upskilling teachers (neither in Poland, nor in Spain, Greece or Cyprus). With time, students will expect teaching materials and methods of their presentation to be more engaging and of higher quality. That is where VR comes in – with its high attractiveness and new technological ways to present information and even develop skills. Moreover, VR training courses seem to have great "learning retention" possibilities understood (in psychology) as the ability to memorize (indicated as one of the key elements of the learning process). The use of VR in education and training is definitely one of the learning process-related aspects that need further exploration.

That is why the Guide includes a detailed learning plan (syllabus) for teaching "Communication Skills" with the help of the CoViR platform offering an array of digital materials (e.g. multimedia resources, videos or role play scenarios) to be used for the purpose of training. The Teachers' Guide also includes a handbook that, step by step, shows the trainer how to use the above-mentioned materials. The Teachers' Guide will help prepare teachers for the use

of VR and delivery of many training techniques through VR. For the purpose hereof, teachers are understood not only as teaching staff employed by formal education providers, but also as VET trainers and instructors teaching in a non-formal or informal context, including on-the job training.

The main goal of the Teachers' Guide is to recognise teachers' competencies in VR and set a standard of requirements to be met by future experts that will become VR teachers. The theoretical basis of this publication include the theory of iterative learning, theory of continuing education of adults, theory of multi-side education, connectivism and theory of human capital. This Guide aims to support future VR teachers that will disseminate the new approach among educators, sharing awareness with competencies in digitalization and virtualisation (and integrating those aspects into decisions to be taken in teachers professional careers). The Guide describes the methodology, materials, tools, and evaluation results and supplements them with feedback from trainers and trainees, extra guidelines and best practices. The COViR consortium consists of seven members mentioned below, who represent the relevant stakeholders delivering various experiences:

- LUKASIEWICZ Research Network – Institute for Sustainable Technologies (Ł-ITEE) as the coordinator;
- M.M.C. Management Centre LTD Limited (MMC);
- EDITC LTD;
- SENSEWORKS;
- FUNDACION EQUIPO HUMANO (FEH);
- HELLENIC CONFEDERATION OF COMMERCE AND ENTREPRENEURSHIP; and
- CYPRUS CERTIFICATION COMPANY (CCC).

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Introduction

Technological and organisational transformations enforce changes in the contexts of work (Szlosek F. 2018) and the competence profile of a Meta VR teacher (or trainer/instructor) is an answer to this „*signum temporis*" thanks to the use of new ICT tools. This document is a guidebook – hence it does not need to be read from cover to cover, but it can rather be used as a supplementary material for future VR teachers that are experienced in education but have no competencies in VR. **The main purpose is to recognise competencies needed from future VR teachers and to define ancillary means and methods that will support them in becoming skilful in that social role (with self-education).** The Guide shows that being a VR teacher is a lifelong learning process, just as becoming a teacher is about constant aspiration to become a "complete teacher" (Kwiatkowski S.T. 2017).

This Guide is for you, especially if you are:

1) looking to diversify your career paths or broaden your skill set within your current role (check: www.puromarketing.com, www.expansion.com);

2) willing to share (and concurrently expand) your knowledge of digitalisation across schools and in-company training context;

3) in a leadership position and want to lead the VR transition within your team and organisation (school, company, university);

4) open to continuously develop your competencies, including expanding knowledge of design and innovation implementation for VR.

Chapter 1 provides information on the learning and training process, such as functions, cycles, and stages. There are also some references to the retention of education outcomes (i.a. Deming's Cycle or the Dale's Cone of Experience) that might be interesting to future trainers. Subsequent chapters describe specific factors connected with training and its efficiency. In the process of "training the trainers", there is a need to select proper learning contents (with expected outcomes – Chapter 2) and learners (see Chapter 3). In order to do that, we should also plan the learning process (Chapter 4) and develop a training programme (Chapter 5) with consideration of the requirements (Chapters 7–9). The training process should be prepared in a way enabling its future development so it has to include

also such elements as feedback (Chapter 6) and evaluation. In the context of dynamic changes observed especially with regard to new technologies being implemented, teachers should be active people with such features of the character and abilities like: originality, self-reliance/autonomy, innovativeness, openness to experiences (Sałata E., Włodarczyk D. 2017, p. 49). This is crucial in order to maintain authority and encourage participants through leading by example.

Chapter 1. VR training learning retention

Play is how we bond, form, and test relationships –
 playfulness makes these serious tasks fun and engaging.
(Stewart Brown)

1.1. Training and playing

Nowadays – especially in the context of the COVID-19 pandemic – we can observe continuing struggle in the process of a world-wide transition from "information societies", in which great role in economic development was played by ICT, to "societies of knowledge". There we see growing importance of critical thinking and quality of information that is to be transformed into certain knowledge and protect us from Z. Bauman's *miseducation* (*greenwashing* is an example commonly witnessed these days).

With the increasing importance of non-formal and informal education, there is a wider range of methods and tools supporting skills development. Their diversity has a great potential to be used especially for teachers (who by definition are a more demanding group of the continuing education participants. Potential of the use of Virtual Reality (VR) and Augmented Reality (AR) technologies in the education has been revealed during last years, especially in the context of pandemia. Knowledge on diverse methods of learning and teaching has become of key importance to the improvement of the didactic work of teachers and trainers (see: Polish Integrated Skills Strategy 2030). Using selected rules, tools and recommendations described herein might help teachers and trainers reach higher levels of teaching/training efficiency; however, even well-experienced educators are likely to find in the Guide something enriching.

Training can be understood as the forming of skills and attitudes requiring basic theoretical preparation. It is also connected with the psychological term of a "transfer" understood as an impact of learning outcomes on other knowledge, skills and abilities acquired by the participant. The goal of the training is to *convey information that will be stored in long-term memory and*

maximally insulated from forgetting and that is called "learning retention" (Maddox T. 2020). Gamification is an element of education widely used in training, especially in business context. The gamification *guru* – Gabe Zichermann – says that employees taking joy from work are more eager (+40%) to acquire more knowledge and skills (Świtalski W., p. 63).

From the perspective of cognitive psychology, *learning* (as the main goal of the training) is about the creation of proper conditions to learn. It is a line of biochemical changes, evolving in the brains of participants while learning progresses. Trainer doesn't have any access to the learners' brains but can assure such environment that those positive changes could be developed with the possible greatest benefits to the attendee (Kutschenereiter-Praszkiewicz I. et al., p. 11). Learning is a process by which (thanks to experimenting) we can observe relatively constant changes in the behavioural potential (Anderson J. R. 1998, p. 21).

Another important aspect of learning in the 21st century is the theory of "connectivism"[1] developed by Siemens G. and Downes S. as the way of having combined the peer networks with (information) nodes or e-learning platforms, etc. Teacher guides learners to information and answers key questions (if needed), while students are also encouraged to seek out and sharing information on their own.

In the case of adult learning, distant and blended methods support also realisation of another theory of "capable organisation" developed by Cairns and Stephenson. They define two important abilities of "capable" people and organisations of the 21st century, i.e. flexibility and adaptability. That is why we need to teach participants (in the learning process) to manage themselves. The basis for acquiring new competencies and new skills at the workplace are the trust and discretion, thanks to which learner gets more and more important tasks to perform – they enable better development (Felstead A., Fuller A., Jewson N., Unwin L. 2009, p. 29). Cairns and Stephenson's theory of "capable learning" indicates a need to educate professionals' flexibly with the use of diverse techniques and

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[1]   L. Pierattini, „En la era del metaverso, estos serán los trabajos más difíciles", *GQ*, 13 de marzo de 2022, source URL: https://www.gq.com.mx/entretenimiento/articulo/metaverso-y-economia-bolsa-de-trabajo-futuro.

technologies, which will enable easier acquisition of competencies necessary for teachers.

Common ethical standards, both for teachers/trainers and other professionals, help modern societies to stand up against the challenge of increasing complexity of societal life. An educator has to be a person with moral qualities, and guidance can be found in formal documents like *Standards for education preparing to practise a teacher profession* (Regulation of the Polish Minister of Science and Higher Education, Official Journal of Laws No. 1450, 2019).

The main function of *learning and training* is about change, it is about shaping the readiness and ability to do something we want or must do. It is about being competent, which means having proper competencies (connected with knowledge and skills). There are some well-known taxonomies of learning outcome assessments (e.g. B. Bloom's or B. Niemierko's) that might be helpful.

1.2. Training cycle and learning retention

In the process of training the trainers, we should properly select candidates (see Chapter 3) and the learning contents (with expected outcomes – Chapter 2). In order to do that, we should also plan the learning process (Chapter 4) and develop a training programme (Chapter 5) within the required surrounding (Chapters 7–9). The training process should be prepared in a way enabling its future development, so it also has to include such elements as the feedback (Chapter 6) and evaluation with relevant assessment methods. Other important issues of training preparation are legal and ethical aspects concerning such sensitive matters like personal data protection and copyright.

Those components stand for basic structure of the training – nevertheless, strengthening participants' learning retention is also about self-analysis of the learning process that is implemented with the adoption of the Deming Cycle (PDCA – Plan-Do-Check-Act or PDSA – Plan-Do-Study-Act).

The main components of a training cycle should be connected with performed job or a role. Such factors very often are related to designed training modules – still preferred in adult education, mainly for flexibility reasons (Symela K., ILO, 1999).

Figure 1. Deming Cycle

Source: https://www.hse.ie/eng/services/list/4/mental-health-services/mental-health-guidance/resources/the-quality-cycle/

Training should focus on the participant who is at the central point of the learning process – she/he should be able to drive learning and assess (evaluate) its progress. A trainer is than more like a guide or a companion that has a crucial role in strengthening motivation to acquire knowledge and competencies. A trainer should create optimal conditions for learning (i.e. create performance-boosting atmosphere) and develop most useful educational situations enhancing learning. While creating such an environment, trainers should remember that the most efficient learning is **"learning by doing", including VR and/or "active participation"** illustrated with the Kolb's Learning Cycle (Figure 2) and learning retention pyramid (with Dale's Cone of Experience – Figure 3). While trainers can start with any chosen phase of the cycle, they cannot exclude any of them (Ornatowski T., Figurski J, 2000).

It is essential for trainers to know about their group and their individual requirements. In some cases, participants may have learning or physical disabilities and as a trainer you may need to be prepared to make some changes in your session plan and facility, when appropriate.

Figure 2. Kolb's Learning Cycle in the gaming context
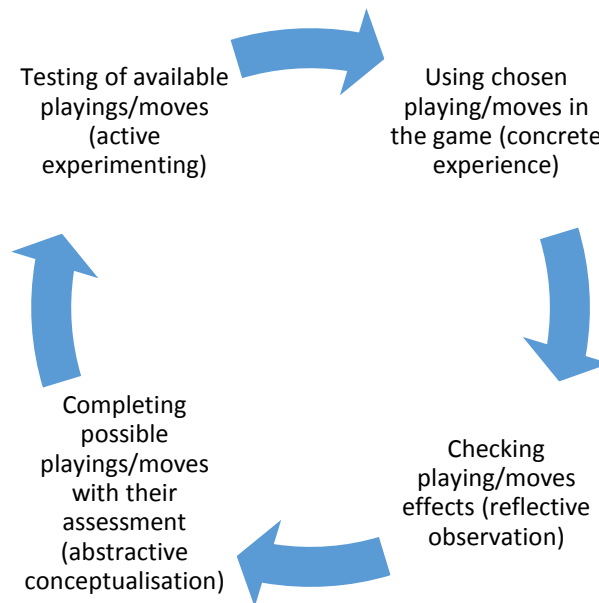
Source: Świtalski W., *Uczenie się dorosłych w zabawie*, Łódź 2019, p. 196.

Another illustration of the efficacy of learning methods and their retention are the schemes based on the Dale's Cone of Experience (Figures 3 and 4).

Figure 3. Dale's Cone of Experience
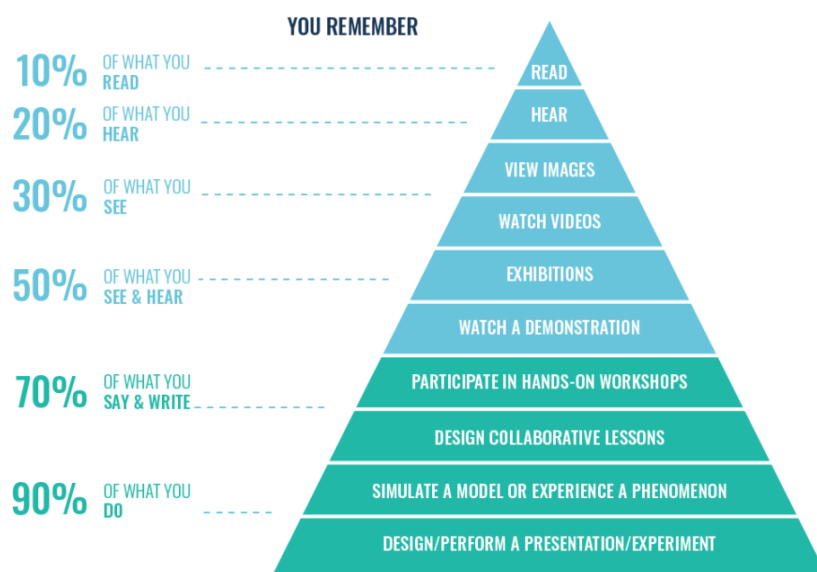
Source: https://www.growthengineering.co.uk/what-is-edgar-dales-cone-of-experience/

Figure 4. Learning Retention Cone with VR distinction

Teaching & Training others	90%
Doing (Including VR)	**75%**
Group discussion	50%
Demonstration	30%
Audio-visual	20%
Reading	10%
Lecture	5%
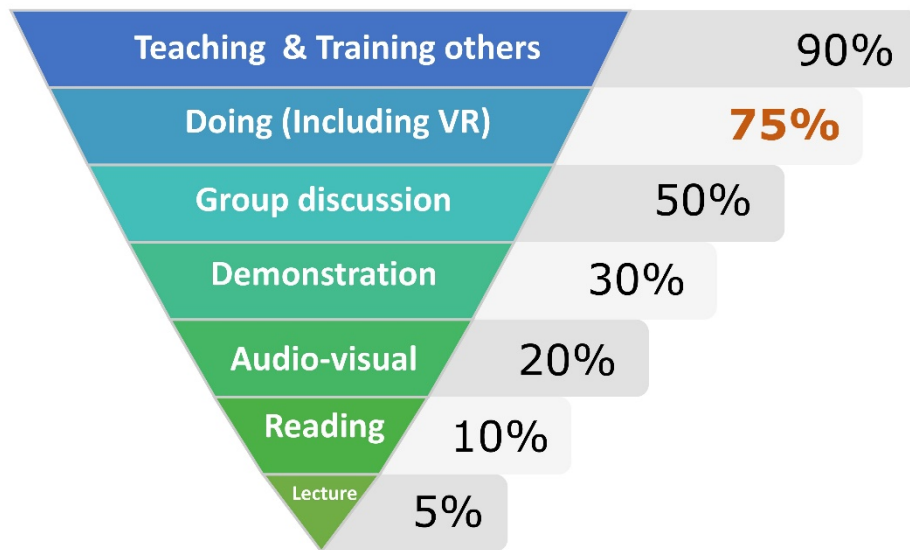
Source: Stępnikowski A., OECD 2022, p. 12.

In order to optimise learning and training processes, we should establish a **VR training cycle** which is a systemic approach to the development, delivery, and continuous improvement of a training programme with the identified six stages, i.e.:

1) Identification of the VR training needs;
2) Design of the VR training;
3) Development of the VR training;
4) Delivery of the VR training;
5) Application of the training in the VR apps; and
6) Evaluation of the VR training programme.

(Source: https://thepeakperformancecenter.com/business/learning/course-design/developing-a-training-program/the-training-cycle/).

Firstly, you have to conduct an assessment and analyse the data to identify specific needs (sometimes training might be commissioned by an institution with clear expectations in mind, which enables a tailor-made programme to be prepared). Then, your task is to find the reason to conduct the training – if you determine it as a necessity, the analysis should tell you what (content) should be

taught and how (with what methods) – with reference to the distant and self-learning. Your goal at this point is to collect all data needed to determine the skills/competence gap between a job/position requirement and an individual's actual skill/knowledge. Supervisors, mentors and/or facilitators should also available to support the process of applying learning outcomes (fostering learning retention). Feedback helps attendee apply their learning outcomes.

The last stage in the cycle is about evaluation and training quality assurance (which are helpful before starting our next training). Such evaluations are conducted in order to obtain information on the effectiveness of our training programme and its content. The most useful thing to do here is to evaluate the training after some time (even a several weeks after the activity) in order to verify whether the attendees have made an attempt to implement learning results.

However, some training organisers also require also measurement of the learning process efficacy. Usually this is done with objective performance indicators selected purposely for each level of the expected efficiency. Quite commonly methodologists and trainers use here the Kirkpatrick's Model with all four levels or select only a few of them – depending on the content and the goals to be attained with this training (described in the last chapter with key performance indicators for measuring training efficiency).

Summary (conclusion for practitioners): *Training is a process in which we can experience changes (in our brains and our attitudes) if we are able to engage participants, and in order to do that, we need to give them motivation – in our context it is teaching things which will be applicable on the job. Take that into account when planning your training (with inclusion of stages of the training cycle).*

Exercise 1.

From the descriptions below, choose three (3) features that characterise training.

Proposed features	Training features
a) *Training is understood as the forming of skills and attitudes requiring basic theoretical preparation.* b) *Training is mainly about change, it is about shaping readiness and ability to do something we want or must do.* c) Training should focus on the surrounding that is at the central point of the learning process. d) *Training cycle's main components should be connected with performed job or a role.* e) Training is enhanced especially when attendees have no time to reflect upon the content and have conditions to do that.	

Progress test

Are you able to:	Yes	No
1) Define training and its function?		
2) Identify main components of the training cycle?		
3) Plan training to meet the identified needs?		
4) Describe the goals of the training assessment and evaluation?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 2. Learning outcomes

If asked to name an activity for which humans are optimised, like the albatross to fly or the cheetah to run, it would have to be to learn. Our brains are extremely effective vacuums for information that can do nothing else but record everything important around us and process it in the most efficient way. (Spitzer 2007)

2.1. Distinction between knowledge, skills and competencies

If you want to foster the learning process and its retention, you need to define learning outcomes of the teaching/training. **Learning outcomes are commonly defined with the terms of knowledge, skills and attitudes that create (together) a holistic educational form of competencies** in such spheres as:

a) Cognitive (e.g. knowledge, understanding, use, analysis, synthesis, evaluation);

b) Emotional (e.g. perceptron, reaction, valuation, organisation and characterisation)

c) Psychomotorical (e.g. perception, attitudes, directed reactions, mechanisms that respond to the previously learned reactions, explicit complex reaction, adoption and originality (Bloom's taxonomy with three spheres of goals).

Looking at the *Bloom's taxonomy of learning outcomes*, we can say that knowledge, skills and competencies overlap. In order to acquire higher level of competencies, participants should previously acquire all necessary lower levels of knowledge and skills (only then they will be ready to change the attitude).

Our learning outcomes are described mainly in terms of competencies connected with attitude shaping. As a phenomenon, competencies appeared in the USA in 1916 mentioned by J. Dewey (*everyone has the right to develop their competence*) and werer later on elaborated in the "Raport True" where authors bring the idea of a *competent teacher* (1929).

Competencies play a significant role in personality development (as one of its factors) but they also help to build up societies and communities. They reveal possibilities (potential) of the person to perform on the job and indicate the level of her/his usefulness to

certain position, action or profession. Competencies determine (in most cases) the division of the professional tasks and functions to be performed. To some extent, they also determine occupational competence content, professional position and the level of salary. They also influence our ability to be involve in the forms of continuing education/ life-long learning (Cairns L., Stephenson J., 2009, p. 31–32). Future trainers should have such competencies, be ready for life-long learning and to share their experiences. Figure 5 shows future trainer competencies.

Figure 5. Future competencies
(Włoch R., Śledziewska K., DeLab, 2019)

2.2. Competent VR teacher (in terms of knowledge, skills and attitudes)

Learning outcomes depend on the purpose of the training programme and in this case such purpose is the training of teachers – understood as equipping them with all necessary information (and skills with attitudes) that will enable them to exchange their knowledge and experiences. In order to support future trainers (our learners), we should ask ourselves a few questions and prepare some

useful hints that will guide our readers in that path of excellence. The most basic questions are as follows: *Who is a competent VR teacher? What competencies should define such teachers (or trainer)? What kind of person should she/he be? What methods are the most effective in the case of VR?*

There is no one simple answer but we can probably define a teacher or trainer as a person who has mastered a certain area of professional activity and has the potential to share experiences in the most efficient way with the use of dedicated methods and tools. Depending on the content of the training or trainer's capabilities she/he can mix some roles such as coach, mentor, tutor while using also teacher's didactic methods. In order to be an efficient trainer and supportive guide, the person needs to have authority, and that is connected with qualifications, competencies and moral-ethic attitudes, which also involve tactful relations, with participants in the training seen not only as employees/civil servants, but also as individuals. Despite the whole trainers experiences (methods, tools and techniques) the most powerful tools for such a person are personality and professional knowledge on the subject of the course/training. If you have mastered them, you can then choose proper methods to "transfer" the information to participant in the training in the most effective way.

It is also useful to refer to "andragogy", presenting methods and principles used in adult education, contrary to a better-known term "pedagogy" that refers to teaching of children or "dependent people". Adults are self-directed learners and, therefore, the educators of adult learners should not really "teach", but rather "facilitate" their learning.

There are several theories about adult learning, but the most prevalent and widely known are **Knowles' Six Basic Andragogical Principles** (Kenyon, C., & Hase, S. 2001):

1. **Self-concept**. Adult learners have a self-concept, they are autonomous, independent, and self-directed.

2. **Learning from Experience** (previous experiences as a rich resource of learning). Try to refer to them (if you know the learner), while performing actions in VR.

3. **Readiness to Learn**. Adults tend to gravitate towards learning topics that are important to them – their readiness to learn is strictly correlated with their relative uses. Try to look for the content that might be well connected with learners' interests.

4. **Immediate Applications**. The orientation of adult learning is directed more towards the immediate applications rather than future uses (that is also a case of VR). Adult learners are rather task-oriented, life-focused, and problem-centric. Try to use gamification in the VR learning environment (and badges or microcredentials, if possible)

5. **Internally Motivated**. Adult learners are more motivated by internal personal factors rather than external coaxes and pressures.

6. **Need to Know**. Adult learners have the need to know the value of what they are learning and the reason (why) behind the need to learn it (source: URL: https://eric.ed.gov/?id=ED456279).

Tab. 1. Learning outcomes of the COViR communication skills course

(Learning outcomes) the learner is able to:		
in terms of knowledge:	**in terms of skills:**	**in terms of attitudes:**
Describe active listening techniques	Adapt communication according to the case	Recognise the importance of self-improvement
Describe active listening techniques	Effectively use active listening techniques to resolve issues	Adopt adult behaviour according to the transactional analysis
List the basic principles of transactional analysis	Combine communication techniques effectively	Be aware of the importance of both verbal and non-verbal communication
List words and phrases that facilitate communication	Use confidence and dynamism when speaking to a public	
Present the three rules of body language	Use words that facilitate communication	
Explain possible meanings of non-verbal cues (facial expressions, gestures, body language, posture and distance)	Use their voice effectively, adapting it based on the situation (argumentation, conflict, etc.)	

	Use their body language effectively with emphasis on gestures, eye contact, legs and distances	
	Increase their effectiveness in communicating with each interlocutor by using verbal and non-verbal (body language) communication	

2.3. Units for the training of VR teachers

The main objective of this module is to equip future VR teachers/trainers/instructors with certain competencies, methods and techniques that will enable them to support the virtualisation of education (especially in VET).

In order to achieve that goal, we need to deliver tailor-made training for candidates that will include professional/substantive preparation and teaching/training competencies, methods and techniques with the adequate use of e-learning and tutoring (that will support individuals' self-learning process). In this light, **the training of VR teachers will consist of nine units including**:

Tab. 2. Units of the COViR VR Teachers training

Unit 1	What is Virtual Reality?
Unit 2	Main steps in the history of VR Applications
Unit 3	Advantages of VR
Unit 4	VR head-mounted devices & main parts of VR headsets
Unit 5	Challenges
Unit 6	Interaction in VR
Unit 7	VR limitations
Unit 8	Differences and similarities between Virtual Reality, Augmented Reality and Mixed Reality
Unit 9	VR in education

The programme is planned in the form of an e-learning course (especially due to COVID-19 pandemic experiences and with respect of the time needed for retention of learning outcomes) and tutoring that may be needed for different participants, their capabilities, conditions, etc. This e-learning course provides basis for the theoretical part of the Meta VR trainer's validation (conducted in two parts). The second part of the validation is practical – performance of tasks in the VR learning environment. In the case of the COViR project, the partners have decided to check candidates' skills in the VR learning environment by giving a specific task to perform:

1. *Change the name of your avatar – 1 point (we need to tell them before logging in)*
2. *Customise your avatar (at least a change from the default one) – 1 point (we need to tell them before logging in)*
3. *Please take a seat – 1 point (we can indicate a specific place to take)*
4. *Please open the presentation that you will find in the control panel – 1 point*
5. *Please navigate to the presentation – 1 point*
6. *Please write one sentence on the whiteboard – 1 point*
7. *Please delete/erase the sentence you wrote – 1 point*
8. *Please make a post and place it on the post it board – 1 point*
9. *Please create a poll / submit a question "Do you like the COViR Project?" – 1 point*
10. *Please change your expression – SMILE! – 1 point*

Uploaded on COVIR platform presentations on communication skills (task 4) are described here in chapter 7.1. *Educational packages and toolkits for VR teachers*. After confirmation of the candidate's actual knowledge (with regard to the VR) and skills in the COViR classrooms, the candidate can receive a Meta VR Trainer certificate.

Summary *(conclusion for practice):* It is worth remembering that competence-based learning is very popular nowadays, especially as competencies are described with: complexity (include different elements like knowledge, motivation or attitudes), operability, variation, and measurability. Competencies can change, be graduated (with the level of proficiency), and developed. Nowadays, the basis for human resources management are competency models or profiles that are created as a set of all competencies needed from employees of a particular organisation, grouped for adequate profiles for certain jobs or roles (such as VR teachers).

Exercise 1.

From the descriptions below, choose three (3) that characterise training.

Proposed features	Training features
a) Our knowledge determines the division of our professional tasks and functions to be performed. b) *According to Bloom's taxonomy of learning outcomes, knowledge, skills and competencies overlap, and in order to acquire a higher level of competencies, participants should previously acquire all necessary lower levels of knowledge and skills (only then attendees are ready to change the attitude).* c) *Generally, teachers' attitude is expressed in the operational reliability, aspirations to constant self-improvement and unique/individual treating of the participants.* d) We can define trainer as a person who speaks freely on every topic, has the potential to share reflections with anyone, and wants to use dedicated methods and tools. e) *Validation of Meta VR Trainers is done in two parts: theoretical and practical.*	

Progress test

Are you able to:	Yes	No
1) Define knowledge?		
2) Identify 2 main features of competence?		
3) Define VR teaching competencies?		
4) Name at least three out of nine units of the VR teacher training?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 3. Learners' profiles

A mind that is stretched by new experience can never go back to its old dimensions. (Oliver Wendell Holmes Jr)

3.1. Learners differ

It is never too late to learn. Researchers from the Singapure University conclude that there are no age limits to re-skill yourself, also in such areas as inclusiveness or self-reflection (Maclean R., Jagannathan S., Sarvi J. (Eds.) p. 50). Also E. L Thorndike (in the 20th century) indicated that in adult teaching (andragogy) general intelligence is more important than the age itself. "Old-timers" are "treasures" – very valuable assets of the institution (school, company), as they can also be mentors for younger employees. Teaching others is one of the most efficient ways to educate ourselves.

Age is not the only factor bringing differentiation among learners. **There are many things that influence participant's attitude to the training**, some of them are connected to the individual's human nature and capabilities – such as gender, disabilities (intellectual or physical), while others to the external world, like surrounding (classroom), attitude of the group or financial conditions.

Apart from addressing specific needs, the trainer should also take into account **different types of learners**. Generally, they can be divided according to the presented attitudes such as:
- **Inquirers**
- **Knowledgeable**
- **Thinkers**
- **Communicators**
- **Principled**
- **Open-minded**
- **Caring**
- **Risk-takers**
- **Balanced**
- **Reflective**
  (https://www.shaker.org/LearnerProfileAttributes.aspx).

VR teachers should be aware of learners' objectives and motivation, provide them with understanding, equal access, support them in a way they'll need in the context of learning think of:

- **success factors** (that may affect the learning process);
- **strategies** (participation, self-reflection, activities, small groups, pairs, with support/interpreter, practice);
- **styles** (e.g. visual, auditory, and kinaesthetic); and
- **technology use** (do the learners have access to it? Should they be supported individually or have some specific needs? (source: equalityanddiversity.net).

3.2. Profile of the future VR teachers

With the dynamic changes in the surrounding world (abundance of data making information verification harder, Internet, globalisation, mobility, environmental and energy problems, etc.), there are growing competency gaps observed between professionals and other employees. Members of professional networks and communities usually share similar views and opinions on perfomed jobs, use similar language and may strive to achieve common goals, as specified in applicable national strategies. The training of Meta VR Trainers is a programme that makes self-development possible – leading to professional mastery. Their work pillars, like in other public services (i.a. teachers) should be: professionalization, professional identity, engagement and practice (Budkowska L., Poszytek P., 2018).

Meta VR Trainers should understand most common mechanisms connected with learning more than one person in VR. This can, for example, be "socialisation" that is continual adaptation to other individuals or groups, roles and situations (that component is also available in the VR learning space of COViR). Another supportive factor can be the "culture of pedagogy" that consists of the teachers and society's beliefs and attitudes (Okoń 1981). Our connections with societies and groups/communities also influence perceiving in our brains (Spitzer M. 2011, p. 72).

Summary (conclusion for practice): *Its never too late to learn. You can also learn by teaching others; however, it should be conducted with proper reflection. In order to deliver learning outcomes effectively, you should bear in mind that learners differ and you need*

to take their specificity into account while planning the programme and while delivering it. Try to search for things that connect you with the community/group of participants and adapt yourself to the situation and their ways of behaviour/manners.

Exercise 1.
From the descriptions below, choose three (3) that characterise training.

Proposed features	Training features
a) E.L. Thorndike states that people aged between 45 and 70 can't learn; b) *Teaching others is also one of the most efficient ways to educate ourselves*; c) *While planning the training, you should think of learning: styles, strategies and successful factors, and connect them with the use of a technology*; d) Future VR teachers don't have to integrate e-learning courses with the VR environment; e) *Thinkers, principled, open-minded are examples of learners' profiles.*	

Progress test

Are you able to:	Yes	No
a) Argue that age is not a significant factor when it comes to the effectiveness of adult learning?		
b) Indicate at least three learners' profiles?		
c) Indicate at least three competencies in communication?		
d) Give an argument for taking into account learners' profiles?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 4. Process of education

4.1. Psychology of education

Psychology refers to description, research and discovery of rules and interactions observed between psychic phenomena. Psychology as a discipline examines factors that constitute organism activity in the external surrounding (oriented for exploration and reshaping attitudes). Development of psychology is connected with other disciplines such as cognitivism, neurobiology and many others. Cognitivism was developed by the following scientists:

- J. Piaget (phases of cognitive development);
- L. Wygotski (social constructivism);
- E. Erikson (theory of psychosocial development); and
- D.P. Ausubel (cognitive learning theory).

It is generally about „leaving the comfort zone" (Wygotski's "closest development zone"). Based on the knowledge (and experiences) gained in this zone, we can acquire further skills, explore them and upskill with our next developments covering new areas (enabling performing more difficult tasks). Self-development is conditioned by two interconnected processes of maturing and learning. Mental development can be influenced by cognitive achievements, surrounding (also VR), our own activity, and upbringing. By creating proper conditions for development.

One of the complex education approaches for adults is the method of "LearnCoaching" that serves supporting knowledge construction (Kutschenereiter-Praszkiewicz I., et al. 2010, p. 23). It explores constructivist and cognitive approaches, also including elements of neurobiology. Learncoaching uses a mix of components, e.g.:

- *Activation of learners' existing knowledge* ("*pre-knowledge*");
- *Assistance in indication of learning milestones*;
- *Process-oriented evaluation of goals*;
- *Enhancing focusing and remembering*;
- *Searching for solutions, not problems* and *development of performance-boosting atmosphere* (Kutschenereiter-Praszkiewicz).

In adult learning, distant and blended methods also support us in the implementation of another theory – the theory of capable

organisation developed by Cairns and Stephenson. They define two important abilities of "capable" people and organisations of the 21st century, i.e. flexibility and adaptability. We need to put effort on participants (of the learning process) in order to enable them managing his/her progress. The basis for acquiring new competencies and new skills in the workplace are trust and discretion, thanks to which the learner gets more and more important tasks to perform – they enable better development (Felstead A., Fuller A., Jewson N., Unwin L. 2009, p. 29). Cairns and Stephenson's theory of "capable learning" indicates the need to educate employees' flexible with the use of diverse techniques and technologies (like VR/AR), which will enable easier acquisition of the required professional competencies.

4.2. Active and experimental adult learning

Kolb, Winter and Berlew's (1968) research results indicate that the effect of the change is greater if the learner has an influence on the change process and if the goals are designed deliberately as the desired "states of things" that we plan to achieve in a certain/concrete period of time. Adults learn most efficiently if the learning content refers to problems they experience (want to solve) or to goals they want to achieve, and if the attendees can:

- see practical meaning and value of what they learn;
- influence the process of learning;
- get involved in teaching/learning process voluntarily;
- express their opinions without fears about censorship;
- make mistakes without being judged or punished; and
- be actively involved in the learning process and their experience is considered important (Symela K. 1999, p. 31).

The Meta VR Trainer also has to be aware of the impeding factors that can adversely affect the training process. Awareness of such barriers in adult learning will help facilitate adequate preparation of the training and determine trainers' behaviour/attitude throughout this class. Such obstacles include, i.a.:

- *Pride* (affecting learners' openness to learn new things);
- *Lack of self-confidence* (caused by the fear of failure or making a fool of oneself in front of the whole group);
- *Self-perception* (belief that you are unable to learn new things or that you already know everything in a given area);

- *Lack of interest* (the most difficult barrier to overcome, often seen when people "were told to do the course") and *Lack of motivation* (Symela K. 1999, p. 32).

It is important to choose learning methods with regard to factors like:

- objectives and tasks specified in the training programme goals;
- intellectual and psycho-physical level of learners readiness;
- categories of modular units;
- time provided for module completion;
- available didactic and technical base (also in the VR);
- qualifications/competencies and experience of trainers; and
- organisation of the training (also online activities, VR, etc.).

Table 3. compares efficacy of VR education with other pedagogies.

Tab. 3. Framework connecting VR education with universal pedagogical approaches and competences

COMPETENCE	Universal-based					VR education
	Case studies	*Inter-disciplinary team teaching*	*Lecturing*	*Mind and concept maps*	*Project and/or problem-based learning*	*Virtual Reality-Based Education*
Interpersonal relations and collaboration	✿	✿			✿	✿
Empathy and change perspective	✿	✿	✿		✿	
Communication and use of media	✿			✿		✿✿
Personal involvement				✿	✿✿	✿✿
Assessment and evaluation	✿		✿	✿	✿	✿
Points in total	**4✿**	**2✿**	**2✿**	**3✿**	**5✿**	**6✿**

✿✿**)** pedagogical approaches that usually contribute to the development of certain competences

✿**)** pedagogical approaches that are likely to contribute to competence development.

Source: Authors, based on Stępnikowski A. 2022, p. 32, Bianchi G. 2020, p. 27, see also: Lozano at al., 2017, p. 10).

It seems that universal methods are rather more general (less effective than dedicated ones), except two positive examples of "case studies" and "project/problem-based learning". There is still a lot to discover as it comes to the use of VR in the result-oriented learning. It is hard to "grab this issue" as it strongly depends on individual predisposition of learners, especially in the psycho-physical context.

Summary (conclusion for practice): *Experience-based techniques of learning include:*

- *respecting learners' previous experiences (try to know them and make use of them)*
- *being a facilitator encouraging learners to search for information rather than a provider of facts;*
- *giving learners a chance to make their own discoveries;*
- *appreciating learners' opinions and views; and*
- *asking questions rather than giving ready answers*.

Exercise 1.
From the descriptions below, choose three (3) features that characterise training.

Proposed features	Training features
a) Activation of pre-knowledge and creation of performance-boosting atmosphere are parts of LearnCoaching. b) Connectivism is using learners' knowledge and the information from the external environment. c) Pride of the learner helps the trainer to conduct the training. d) Lecture is the most efficient learning method in VR education. e) Adults learn most efficiently when learning refers to problems they experience or goals they want to achieve.	

Progress test

Are you able to:	Yes	No
a) Point out at least two elements of LearnCoaching?		
b) Name at least two famous psychologists that have contributed to the discovery of cognitivism?		
c) Indicate three activating learning methods?		
d) Give arguments for VR education as an efficient way to learn?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 5. Training programme preparation

A Child Loves His Play (not because it's easy, but because it's hard) (Benjamin Spock)

5.1. Planning the scope of the training (with playing)

Implementation of a new training programme may involve a number of issues. If we want to be effective, factors like compliance and quality of the learning process should be evaluated and assessed. Any factor affecting the quality of training needs to be assessed as well. 'Failing to prepare is preparing to fail.' That is why, it is essential that organizers focus on the scope (accomplishment of the purpose) and structure (planning of adequate elements) of the training. When designing the programme, we also have to define realistic conditions of implementation, including equipment and didactic.

Planning the structure of the training programme gives us an answer to important questions, such as: the needs and outcomes, time frame, audience (learners) and needed training methods. Very important is the question about learners' competences. It is worth mentioning that those methods should be activating and motivating. Although we may plan working in groups, we need to remember that learners always learn at their individual pace. The quality of trainers is always essential in the context of the programme implementation. When planning the training programme, a VR teacher/trainer should include:

- the use of media and technology with VR headsets (WiFi and PC, if neccessary);
- the target learner profile (initial communication skills);
- the training objectives in terms of learning outcomes;
- the timetable with the duration of particular training modules;
- the outline of the training method and/or approach;
- the proposed procedures of assessment and evaluation;
- prepare to facilitate and develop all needed instructions;
- the creation and maintenance of a learning environment that is learner-centred and hospitable; and
- the use of gamification.

5.2. Operationalisation of the training plan

All training courses that are planned for continuation should include principles like:

- *Managing implementation through defining objectives and indicating conditions for their achievement*
- *Priority for preparation of materials, organisational and staff-related conditions before starting the workshop*.
- *Grading difficulty levels* (some learning outcomes are visible after a longer time so we need to develop in participants some qualities like persistence or conscientiousness – their acquisition often depends on suitable grading of tasks and difficulties encountered in the course of the training programme implementation; additionally, their values should be indicated);
- *Space for independence and creativity during training* (adjusted to the specific learning situation, especially in VR)
- *Using the existing learning experiences* of an institution (school, company) where the training programme is to be implemented (Symela K., 1999, p. 50).

After planning and describing modules with their general purpose, competencies, time frame and expectations, we should be more precise while planning operationalisation of achieving goals that we have set up. Operationalisation is about planning in a more detailed way enhancing trainers preparation. In social sciences, it is a process of defining the measurement of a phenomenon that is not directly measurable, though its existence is inferred by other phenomena.

- **Methodology (examples)**: technology based learning, instructor-led workshop, active learning, discussion, brainstorming, quiz, competition jury, case studies.
- **Teaching aids (examples)**: VR headsets, PC/laptop and/or smartphone with connection to the Internet and chosen applications (such as: Teams/Zoom, Mural, Swormcheck, Mentimeter, etc.)
- **Excersises can be also practical tasks (examples):**

   a) preparing and giving a presentation on a specific topic;

   b) preparing posts to be published in specific social media; or

c) designing tasks/activities for virtual classroom with the use of a selected IT technology.

Didactic materials and aids are an integral part of teaching programmes and they should be learner-oriented, so he/she could also use them also in a self-learning process or under the trainer's supervision with widely used ICT technologies. Each module is to be assessed and passed separately, which enables the learner to validate learning outcomes in a more flexible way. Here, the trainer is more like a tutor and advisor that plans the learning process, supervises the undertaking and gives feedback on the educational progress.

Modules (examples):

1. *Communication and use of information in VR.*
2. *Effective communication between avatars.*
3. *Image building & self-presentation in VR.*
4. *Presentation preparation (with regard to presentation styles).*
5. *Search for, analysis, and use of information.*
6. *Use of VR technologies in the process of communication.*

- **Validation methods (examples)**

Knowledge tests i.a. on potential information and data resources during simulations of real/potential situations (especially problematic ones) with the use of avatars, and analyses and conclusions (as a basis for further decisions, scenarios of lessons, etc.) can be used to test candidates' readiness and skills. Examples of tasks to be performed during validation in the VR environment (from COViR Classrooms) are presented in Chapter 2.3. *Competent VR trainer*.

- **Certification scheme**

In the case of the COViR project, we predict certificate of a "**Meta VR Trainer**". Certification is conducted in two phases:

A) Theoretical phase: going through an e-learning course in VR (COViR Learning system) with the basis of use of such technology (genesis, main concepts and equipment being used). After acquiring specific knowledge, candidates are invited to take a written test (physically or online), after such confirmation of theoretical preparation we continue certification with the practical part (tasks to be performed in one of COViR classrooms).

Photo 1. Theoretical phase of the VR trainers' certification

B) Pratcical phase – performing tasks in COViR learning environment, starting from basics like taking seat or posting notes, to giving presentations in an attractive form using (but not overloaded with) multimedia.

Photo 2. Practical phase of the VR trainers' certification
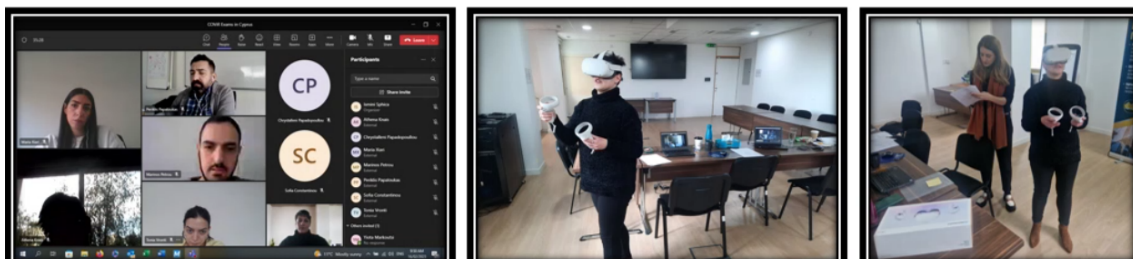
Summary *(conclusion for practice): Before programme's realisation we should assure that trainers have clearly specified objective to achieve during the course (and have extensive knowledge and experience on the subject concerned) and learners are aware of this objective.*

Exercise 1.

From the descriptions below, choose three features that characterise training.

Proposed features	Training features
a) Organizers implementing a new programme must be aware that they will be implementing a concept of training whose effectiveness will be assessed and evaluated. b) Equipment and didactic materials have no significant impact on the form of the training process. c) After planning and describing session/workshops with their general purpose, competencies, time frame and expectations (outcomes), we should more precise while planning operationalisation of achieving goals that we have set up. d) All one-time training courses must be conducted with the respect of the process of improving training programmes. e) Didactic materials and aids are an integral part of teaching programmes and they should be learner-oriented.	

Progress test

Are you able to:	Yes	No
a) Structure a sample training programme?		
b) Indicate at least three elements of training programme design?		
c) Name some examples of teaching aids?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

# Chapter 6. Communication skills and feedback in VR

6.1. Communication loop

History of communication is just as long as a history of humans, and by many it is closely linked to survival skills. Some input in the way of exploring that phenomena was given by Aristotle (where the sender is playing a fundamental role in the communication since she/he is the only one person that is in charge completely with regard to the effectiveness of the message communication). For next centuries its meaning was explored also by Cicero, J.J. Russou, Descartes, Hegel, Ch. Sanders Pierce, Freud, and many others. In the 21st century, Saussure published a general treaty on linguistics, giving the basis for the study of a language and communication – that is still valid.

Communication theory, however, was proposed by S. F. Scudder in the year 1980, with the development of a universal communication law indicating that *[a]ll living entities, beings and creatures communicate,* even though the way of communication is different. This theory says that all living beings, whether they are plants, animals or humans, communicate through sound (e.g. animals roar), speech, visible changes (without water plants wilt and we see that process), body movements, gestures or in any other best possible way to make the others aware of their thoughts, feelings, issues, mood, etc. Generally speaking, communication is about transferring information from the sender to the recipient where the recipient decodes the information and acts accordingly.

Communication is considered effective if it receives the desired result, response or reaction. It is a process related to seven contexts (i.a.: intrapersonal, interpersonal, small group, cultural, mass-media) and in any of those contexts a communication loop exists, enabling successful communication. Context is generally determined by country, culture, and the individual's mindset and attitude particularly (West R. and Turner L.H. 2010, pp. 32-42). However, the surrounding and stimuli, external or internal, determine the actual process of communication. Such relations are presented in *Figure 6. Communication Loop.*

Figure 6. Communication Loop

Source: https://www.communicationtheory.org/
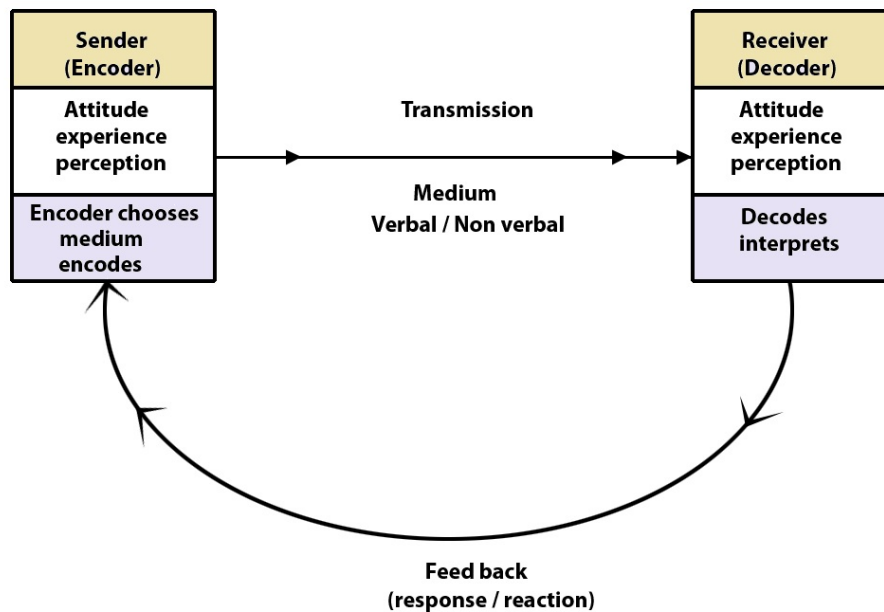
The message is the core idea that the sender wants to communicate. Firstly, the sender should carefully decide upon the precise message that he/she wants to communicate and its purpose. Secondly, he/she should take into consideration the context of his/her communication and the attitude of the receiver. Thirdly, based on these factors, the sender should choose the code and the medium for transmitting the code. The receiver should be familiar with the code and be competent to access the medium of transmission (here we can stress the role of communities of practitioners as they speak the same language/code). In such case, the sender cannot e-mail a message to a receiver who does not have computer or any other device connected to the Internet, nor can he/she write a letter to an illiterate.

The **main barriers to effective communication** in the training course are: disinterest in and dissatisfaction with the training (somebody is forced to attend or has no interest to be there), inability to listen to others, different (not matched) communication styles, contextual, i.a. cultural differences and language, lack of trust and transparency. It all can also adversely influence trainers' abilities

to perform. That is the reason why it is so important to recognise participants' needs (and expectations), to know them (as much as it is possible) and their feedback from similar training courses (if possible). It is also important to have training as a transparent process, where participants also know what is expected from them and have the possibility to share their comments and opinions.

6.2. Formative evaluation and feedback

In 1967, M. Scriven introduced the "formative evaluation" into pedagogy theories; soon this term was changed into "formative assessment" for the need of valuation of the educational programme. Valuing of ready education programme was named by Scriven as "summative evaluation". The definition of learning assessment has changed throughout the years and nowadays it is closely connected with "formative assessment" defined as *an active, continual process in which teachers and students work together—every day, every minute—to gather evidence of learning, always keeping in mind three guiding questions: Where am I going? Where am I now? What strategy or strategies can help me get to where I need to go?* (Moss C.M. & Brookhart S.M. 2019). Formative assessment stands for (I) information on the learning process which (II) teachers/trainers can use for didactic decisions while (III) students are able to use to increase their achievements and (IV) motivates attendees. Some claim that formative assessment is a process used by teachers and students in the learning process delivering the feedback to direct actual teaching on the track of planned learning outcomes.

Try to deliver feedback for the participants in a constructive non-personal manner (but respecting their feelings and beliefs). You should not only point out the knowledge gaps, but also stress the effort they have made and their positive attitude (which increases their motivation). As a participant, you also can, and should, give feedback on the organisation of training, trainers' competencies, etc. **Principles of feedback**:
a) Comments must be sincere.
b) Everyone speaks on their behalf.
c) Each person's contribution is equally important.
d) No immediate reaction to feedback is required.
e) Information should be summative.

Feedback techniques can include: open discussion, metaplan (participants debate and prepare a poster which is a graphic representation of the discussion results), awarding points (on a 0–5 or 0–10 scale) and letters with assessment (Symela K., pp. 104–107).

One of the most common ways to obtain feedback from participants is an **"Evaluation form"** where organizers also ask about the readiness to become a VR teacher in the future. Answers are graded on a 1–5 scale and they can be sum-up with the average grade for each topic in each module. Apart from quantitative measurement, there is also space to share qualitative comments and opinions on every aspect of the particular module or whole training, with a chance to indicate areas in need of improvement.

Summary *(conclusion for practice): Communication Theory is very important in building positive atmosphere of the training that helps achieve educational goals. However, it should be introduced along with other theories. What constitutes a practical implication of such an approach is the feedback reception that helps improve cooperation between training participants and as a result also has a positive impact on new information acquisition and storage in long-term memory (learning retention).*

Exercise 1.

From the descriptions below, choose three (3) features that characterise training.

Proposed features	Training features
a) Communication is considered effective if it ends with the desired result, response or reaction.	
b) In social sciences, the communication process is a result of interaction between the sender and the receiver and this depends directly on the content of speech – "How one communicates" is the basis of the social view point.	
c) The main barriers to effective communication in the training are interest and satisfaction with the training (somebody is eager to participate) and the ability to listen to others.	
d) In the evaluation form, apart from quantitative measurement, there should be also space to share qualitative comments and opinions on every aspect of the particular module or whole training.	
e) As the trainer, you should try to give participants feedback in a non-constructive personal manner.	

Progress test

Are you able to:	Yes	No
a) Understand the basics of the theory of communication?		
b) Indicate the most important elements of the communication loop?		
c) Give feedback in a constructive non-personal manner?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 7. Training support systems and aids

Play is not just joyful and energizing – it's deeply involved with human development and intelligence (Stuart Brown)

7.1. Educational packages and toolkits for VR teachers

The growing importance of ICT solutions can, by didactic means, suport the implementation of adequate learning strategies and provision of training/courses with relevant reference to objectives and substance. Traditional didactic means were mainly used for demonstrative purposes as an illustration of the content conveyed verbally by the lecturer. Nowadays, didactic means can (and after COVID-19 — have to) support all links of the didactic process. They should be applied in practical trainings. What is relevant here, is the idea of "open and flexible learning" means that can be supported with various didactic aids such as: videos, pictures, movies, charts, computer software and apps connected to the Internet, etc.

In general terms, an educational package should consist of a few characteristic elements, such as:

- *Arousing interest* (interesting form and arrangement, short paragraphs and sentences, interesting style of writing, suitable illustrations);
- *Setting out objectives* (explanation of goals to be achieved by the participant and description of conditions and possible levels – with reference to the whole package and its components) – formulated with the use of specific verbs, criteria and standards (enabling their assessments);
- *Selecting the content of information* (flexibility allowing for various starting points and enabling the contents to be divided into adequate units – in terms of quantity and essence)
- *Exercises* (frequent self-assessment with questions and answers, frequent exercises to check the knowledge)
- *Giving explanations* (examples and reference to learners' experiences and full explanation of problematic issues, accompanied by illustrations and summaries and free from slang/jargon and unknown vocabulary (Symela K, 1999, p. 142).

Educational packages should also describe the required basic equipment, duration, assistance/place of training, profiles of participants and objectives; at the end they should also include planned methods of work.

Goals should be categorised by generality (general and specific, direct and in-direct) and type of learning outcomes:

- cognitive (knowledge), connected mainly with facts;

- illuminating (skills) connected with analysis, synthesis but also with activities; and

- educational (attitudes), shape views and attitudes of learners.

Cognitive and illuminating goals are of a didactic nature. Goals should be described in a operationalised way like knowing, shaping, upskilling, ability to indicate, describe, select, etc. Operationalisation of goals is about indicating them, interpreting, making them concrete and adapting them to particular didactic situations, including assessment (Niemierko B. 1997 p. 27). In Bloom's Taxonomy, learning goals are divided into three spheres:

- cognitive (levels: knowledge, understanding, use, analysis, synthesis, evaluation);

- emotional (levels: perceiving, reaction, valuing, organising, characterising); and

- psychomotorical (levels: perception, attitude, directed reaction, mechanism, adaptation and originality).

For the Communication skills course, which is included on the VR platform, the teacher will be able to implement the following "learning outcomes":

Knowledge

- Define communication principles.

- Describe active listening techniques.

- List the basic principles of transactional analysis.

- List words and phrases that facilitate communication.

- Present the three rules of body language.

- Explain possible meanings of non-verbal cues (facial expressions, gestures, body language, posture and distance)..

Skills:

- Adapt communication according to the case.
- Effectively use active listening techniques to resolve issues.
- Combine communication techniques effectively.
- Use confidence and dynamism when speaking to a public.
- Use words that facilitate communication.
- Use voice effectively, adapting it to the situation (argumentation, conflict, etc.).
- Use body language effectively, with emphasis on gestures, eye contact, posture and distance.
- Use verbal and non-verbal (body language) communication to increase the effectiveness of communication.

Attitudes:

- Recognise the importance of self-improvement.
- Adopt adult behavior.
- Be aware of the importance of both verbal and non-verbal communication.

Tab. 4. Content of the COViR communication skills course

Sessions	Duration (hr)
1. Introduction	1.0
2. Communication loop	1.0
3. Verbal communication	1.5
4. Non-verbal communication	1.5
5. Effective (active) listening	1.5
6. Public speaking	1.5
7. Evaluation of communication skills	0.5

However, remember that if you decide on blended or hybrid training, you should adapt your programme accordingly. John Spencer proposes the **SAMR Model**:

- **Substitution**, as the 1st level, uses technology as a direct substitution for the learning task with no significant change. In that way attendee who types an essay on the laptop merely swaps a pencil for a keyboard. So this first level concentrates on technological aspects while next two layers are focusing on transfromation of the learning.
- **Augmentation**, at the 2nd level the technology acts as a substitution with some augmentation. In consequence, that paper essay moves to a Google Doc, where attendees can not only type and edit but also comment on one another's work.
- **Modification**, the 3rd level with technology, it enables significant task redesigning. Essay is now becoming a blog post. Attendees engage in online research, work collaboratively in small teams on a shared document, and publish to an authentic audience. It is no longer an essay for a teacher. Instead, it is an article crafted for the world.
- **Redefinition**, the 4th level, is where technology allows for tasks that were previously inconceivable. That same essay is now a multimedia package, with a blog post, a podcast, and a short video. The research, too, includes video conferences with experts (Spencer J. 2020).

Of course, when preparing presentations using PowerPoint or similar software, you should avoid "overloaded" content with "dozens of slides filled with dense text, figures and complicated graphics" (GLI, p. 7), as participants should definitely be able to read them. Make breaks between PPT presentations and/or interlace them with activating methods (or psychical activities like stretching your arms and moving head around). When planning presentations, leave some space for discussion or interactions.

7.2. ICT supporting learning systems (including VR)

As you can see, replacing traditional methods and tools with ICT is not so simple and needs deeper reflection on and consideration of which means to select. That is why it is becoming more and more important in a time, when we are bombarded with information and need some dedicated space (outside of our brains) to store it. This is

where educational platforms come in handy – they are often developed for particular training courses and offer various technical solutions, visual effects. Sometimes, they are created as an independent course and in other situations they play a supplementary role for trainers' activities (enabling "peaceful" introduction to the problem) and face-to-face meetings.

The digital environment offers new opportunities for adults to participate in educational activities from home or from the workplace, reducing costs of travel and accommodation, especially as regards international events (and it is easier to have guest speakers or discussion participants from abroad). Finally, in the past two years, it has become a necessary mean to deliver training during the pandemic.

Although they are often convinient solutions, we should avoid making online sessions (in front of the computer screen) too long as they can be tiring and ineffective (loss of concentration; not speaking about retention). Such sessions should be about two hours long and be interrupted with break or another kind of activity. It is suggested to have separate roles for a trainer/facilitator (to guide the programme and chair discussions in groups) and a "technical host" to monitor an online session, support participants with technical help and enable attendees to ask questions and make contributions (GLI, p. 7).

What is also crucial, is to deliver further notes or presentations after the event (learning retention) with recordings (if possible). If you are recording the training (or parts of it), remember to get the permission from all participants. If some of them have technical problems (with lack of skills or proper equipment), enable them to use dedicated space or room with other participants that have good quality access to the presentation/training.

That is in line with the theory of "capable workplace learning" (developed at universities in Melbourne and Middlesex) oriented towards capability (understood even broader than competence) of individuals and organisations (Cairns L. and Stephenson J.2009, p. 48). When we consider the use of dedicated ICT tools, we should bear in mind some barriers that are observed among societies, like: digital illiteracy, technological unemployment (more likely to be seen in less developed countries), personalised universal education, and lack of specialists (more likely to be seen in more developed countries). Those are the areas of competence challenges predicted

for AI development in countries like Poland (can be referred also to other highly performing ICT) that need to be addressed with tailored learning models delivering competencies that are missing (Symela K., Stępnikowski A. 2021).

There are also other popular learning platforms, like: Udemy (183.000 interactive video courses, check: udemy.com), Skillshare (join.skillshare.com), Masterclass (possible courses with the Clintons and Gordon Ramsay, check: masterclass.com), Coursera (cooperating with 200 institutions including IBM, Google, check: coursera.org), EDX (cooperating with universities and also offering "boot camps"– intensive, hands-on, Project-based training, check: edx.org).

Examples of use of even more modern ICT solutions can be observed with the VR and AR solutions delivered in the form of "Digital twins" (in industry where apprentice or worker learn to perform vocational tasks not on the real machine (expensive and risky) but on its image with the use of VR headsets.

VR classrooms are becoming more and more popular (in COVID-19 time) as each year we witness emerging 10 platforms per year. One of them was created by Facebook. It is called "Horizon Workrooms" and it includes avatar customisation, whiteboard, shared PC screen and different rooms (https://www.oculus.com/workrooms/). Other VR applications are, i.a. GLUE (has also Doodle in 3D and 3D objects import, taking notes, team files http://glue.work/), MeetinVR – giving a high five and handshakes (https://meetinvr.net/), Spatial with our own image of avatars (https://spatial.io/). However, this is still quite an expensive tool and the second problem is connected with the lack of teachers/trainers' communication skills related to this technology. Such communication skills are developed in the COViR project and they will be included in open-source ready-to-use materials. We should keep in mind highly estimated learning retention for VR solutions (75%). COViR proposes development of a pioneer multi-user e-learning platform embedding VR collaboration rooms (we have two of them) that simulate class training with an innovative offer inside the 3D environment enabling different kind of interaction between the trainer and up to six trainees (they can see their avatars and hear each other), with possible change of face expression, selection of body movements and use of teaching aids, like giving a presentation and writing sentences on a whiteboard (more information at: covir.eu)

Another "catchy" ICT solution that is being brought into learning environment is gaming or gamification (with strong distinction of a competition element). Gamification is about gaining experience in a way similar to playing a game. According to some scientists, in order to have gamification as an effective learning method, we should use elements of fantasy and competition. Game should also reflect players' previous experiences and, if possible, refer to social roles known to the participants (Świtalski W., 2019, pp. 62, 86). Other interesting (for attendees) elements of gamification are: feeling of control, feedback, curiousity, achieving goals (progress) and collecting badges (Stępnikowski A., 2021). Gamification is also more frequently used in "mlearning" – mobile learning with the use of smartphones (Świtalski W., ibidem).

As for collecting badges – in a broader sense called "open badges" or "micro-credentials" (COM(2021) 770 final) – it is also quite a new approach in education. It is a flexible solution that enables learners to get confirmation of the learning outcomes achieved (even little ones), such as those that can be achieved after a few days of the course (or even 20–30 hours of the training), so it is a "friendly" approach to adult learners. In other way, "open badges" can be a graphic or digital expression of milestones that we can collect in our "digital backpacks" throughout our educational journey. Such badges are becoming more and more visible and reliable as they were first introduced at ICT companies (e.g. IBM) to move away from paper CVs etc. and to verify what skills and the candidate has. Open badges also describe criteria for certification, proofs, URL address of the badge, etc. Digital credentialing and badges are also included in the implementation of the COViR project.

Summary *(conclusion for practice): After the COVID-19 pandemic, we can observe massive development of ICT solutions. We saw diverse attitudes of teachers and trainers that needed to adapt to new solutions and implement them. It is hard to mention all the possibilities so here we present the most popular examples of learning platforms and VR communities with "microcredentials".*

Exercise 1.

From the descriptions below, choose three (3) features that characterise training.

Proposed features	Training features
a) Traditional didactic means were mainly used for demonstrative purposes as an illustration of the content conveyed verbally by the lecturer. b) Educational packages should also describe the required basic equipment, duration, assistance/place of training, profile of participants and objectives. c) Teacher should also be a "technical host" in order to conduct everything by herself/himself and have full control over the participants. d) "Digital twins" refer to training in small break out rooms where we can roleplay**.** e) "Open badges" can be agraphic or digital expression of milestones that we can collect in our "digital backpacks" throughout our educational journey**.**	

Progress test

Are you able to:	Yes	No
a) Understand main assumptions of an educational package?		
b) Make distinction between traditional and modern didactic means and methods?		
c) Give arguments for using "open badges"/"microcredentials" in adult education?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 8. Classrom and presentation skills

You have to know a lot and know it well to be able to teach someone
M. Grzegorzewska, *Letters to young teachers*

8.1. Training preparation and delivery (with playing and fun)

As "VR classroom" can be teachers' ally (or enemy), they should know that space very well. In his "Die Smartphone-Epidemie", Manfred Spitzer reflects on the role of new technologies in modern societies, indicating that *forever yesterday people* become victims of the progress (referring also to the industrial revolution repercussions that have caused a lot of suffering and lead to weavers' uprising in Silesia in the 1844). What is astonishing, is that only 1 in 25 students claim that school teachers know how to make use of digital media (Spitzer M. 2021, p. 106, 216). That conclusion confirms that more and more knowledge and skills we acquire outside of the school's walls (and there is a greater need for employees to update competences while working and with the use of ICT). However, the COViD-19 pandemic showed that many teachers are not ready to conduct distant teaching efficiently. If we think of using VR in teaching/training, we should bear in mind the VR teachers have to be open-minded and able to learn from failures as well – as it is important element of all games.

In COVID-19 time, VR classrooms are becoming very popular, as there are around 10 new platforms developed within only during the 2021 year. One of the examples is called GLUE (having Doodle in 3D with 3D objects import, taking notes, team files http://glue.work/), another „Horizon Workrooms" created by Facebook - integrating avatar customisation, handwriting whiteboard, share PC screen and different rooms (https://www.oculus.com/workrooms/). Other VR applications are for example: Spatial with our own image of avatars (https://spatial.io/) and MeetinVR – giving a high five and handshakes (https://meetinvr.net/). These are still quite expensive tools, as we should have VR headsets, and the second problem is the lack of teachers/trainers who would have proper (in VR) communication skills related to this technology. Such communication skills are

developed within the COViR project (covir.eu) and they will be included in open-source ready-to-use materials.

In most cases, VR teachers will organise training in virtualized rooms; however, we should also remember about proper proportion with active and passive methods and positive influence of the workplace on the learning process (Billet S., Harteis Ch., Etelapelto A. (eds.) 2008, p. 12).

Training should be planned well in a logically structured manner, with gradation of difficulty of topics and consideration of substantive links between them. Training programme should be concise and include breaks that will help us to avoid tiredness (blocking participants in acquiring new information and staying focused). According to *OECD Learning Compass 2030*, education is about individual and social well-being, so we should keep in mind that participants should be encouraged to create performance-boosting atmosphere.

Quite interesting to mention here is the idea of innovation labs (I-Labs) that are deliberately created spaces/rooms arranged in a certain way (with murals or wallpaper presenting a forrest, seaside, beach or mountains) and with special objects that link learners with a particular environment. They move students to another space/place, where they can forget about their everyday problems (faced at home or at work) and perform more creatively. Such I-Labs are often used in brainstorming sessions, but not only. Many of them were created under the LdV/Erasmus+ programme and their offer is quite easy to find, as they were created by international consortia. In Poland, such I-Labs function, among others, at the Łukasiewicz Research Network – Institute for Sustainable Technologies in Radom.

Wherever VR Teacher will choose the training place she/he always need to remember to check its adaptability to the programme needs. Such place – also in VR – should help the trainer create proper atmosphere that will help learners stay focused and would be interesting for them. While planning the training outside of our workplace facilities, trainer have to also check all necessary technological infrastructure like computer, screen, equipment (white board, colour markers) and accessability of the Internet – if needed. When choosing such training place, apart from the facility infrastructure, we also need to take into account travel and accommodation requirements and conditions (quality of roads, connections to railway stations and airports – if needed, car parks, access for people with disabilities, number of beds, quality of meals, etc.).

Tab. 5. Communication skills training programme for use in VR

Session	Learner is able to…	COViR Platform Tools
Communication foundation 90 minutes	• Display basic understanding of the communication loop, two-way communication and interaction. • Demonstrate the ability to listen, enhance discussion and ask probing questions. • Understand learners limited capacity to attend and absorb information. • Indicate main barriers to communication.	• Access files that have been pre-loaded to your account • Giving high fives and handshakes • Sticky notes
Two-way communication (interpersonal) 90 minutes	• Understand and use interpersonal skills in the training. • Give feedback in a constructive and non-personal manner (for example during role-playing exercise).	• Customisable avatars • Upload images, videos, pdfs, and 3D objects • Giving high fives and handshakes • Sticky notes
Presentation skills 90 minutes	• Use voice efficiently and interact with others. • Understand physical positioning of others (including avatars in future). • Facilitate group sessions.	• Writing on the whiteboard • Share content • Share PC screen • Import 3D objects • Post-it notes • Take notes • Giving high fives and handshakes
Training methods 90 minutes	• Know and understand the advantages and disadvantages of various training methods. • Select appropriate /adequate training methods including activating ones, like role-playing – reversed roles, case studies	• Writing on the whiteboard • Share content from your PC • Share PC screen • Import 3D Objects • Post-it notes • Take notes • Giving high fives and handshakes • Sticky notes
Validation of communication skills 60 minutes	• Use communication skills and techniques in the given context. • Perform a simulation task.	• Writing on the whiteboard • Share content from your PC • Share PC screen • Import 3D Objects • Post-it notes • Take notes • Giving high fives and handshakes
In total: 7 hours (In the VR environment up to 30 minutes each time (for health and safety reasons), each session should be divided into two or three parts)		

It is worth remembering that learning activities can also be performed in the way of a "play" or "fun" also with the Internet and social media, especially including VR solutions. We must not forget about the elements of play identified by Scott Eberle (expectation, surprise, pleasure, understanding, strenghts and confidence) that are useful for our purposes. (Świtalski W. 2019. p. 27).

In the case of the COViR project, we have two VR classrooms (below).
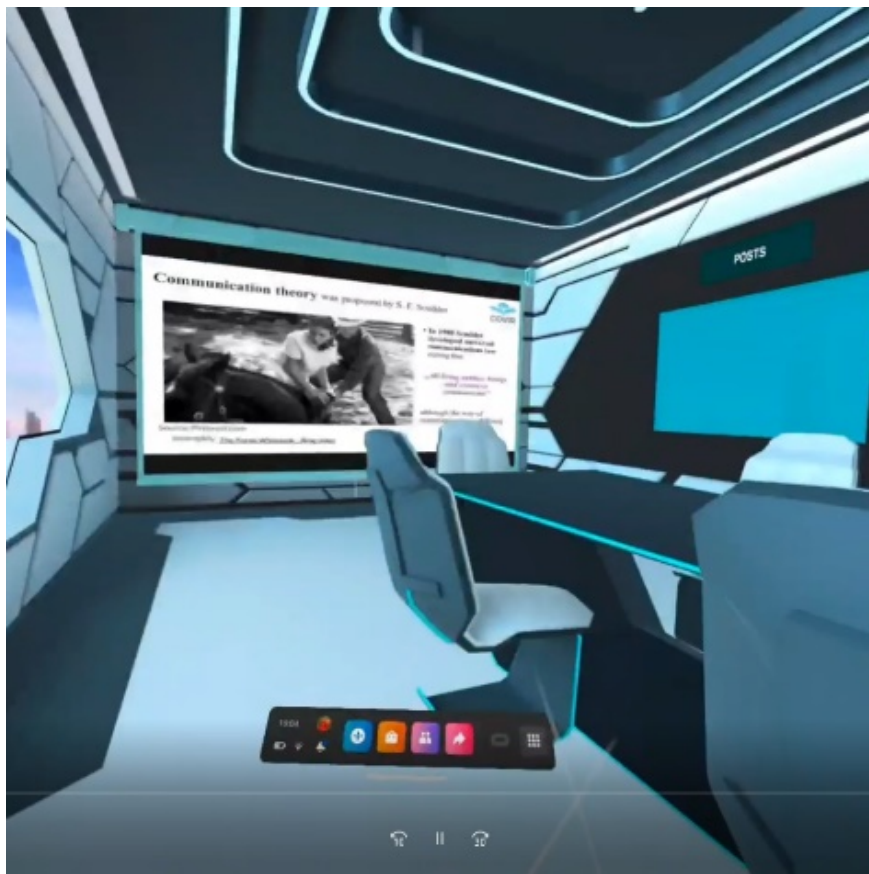
8.2. VR teachers' communication skills

In order to form particular attitudes and skills there is a need to care about their **skillful transmission**. Diverse upskilling with practitioners should motivate trainees to think independently, meet their needs and interests – "awake" personality. A good educator should understand the importance of communication, have substantive knowledge and be creative (especially in VR).

Dynamic changes that we witness, especially new technologies, and widespread access to the Internet and smartphones (Spitzer M. 2021, p. 18) encourage us to long life learning (LLL) and constant improvement of methods that we use. That is the case of all educators. Those changes affects teachers' competencies in professional (with virtualisation aspects), technical, as well as personal and social spheres of life. This part of the guidebook will support teachers/trainers in various aspects with regard to their communication skills [in VR]. They are crucial, as personality of the trainer and that kind of skills create conditions for participants' engagement and stimulation. It is important to keep in mind that in 1908, Yerkes and Dodson proved that too low and too high levels of stimulation decrease efficacy of teaching activities (Kutschenreiter-Praszkiewicz I. et al., p. 50).

Along with the increase in the level of stimulation, we limit the capacity of our working memory, where we process information, but in parallel we witness faster and more effective functioning of our cognitive system that is responsible for our reaction to these stimuli. For each task, there is optimal compartment where we have at disposal enough amount of working memory with appropriate level of stimulation of our cognitive system (Nęcka E. 1994). In order to „regulate" that stimulation during the training educator have a certain „set of means" i.a.: introduction of elements of competition among attendees (gamification!) or appointing tasks to be solved under time-pressure.

A VR teacher should take it into account when planning the training and consider proper forms of activities and presentations. How to do that? How to attract the attention of participants? Like Socrates with his maieutics method, try to run discussions with participants in the way that will "liberate" their knowledge, not simply equip them with information but rather make them start to think (and they will become aware of the knowledge they have). We can achieve

better learning retention if we let participants search on their own and confront results during extensive discussion with other attendees. We perform better and more consequently in executive situations where we have a feeling of our own agency and own competence, when we believe in our abilities and that we can do something (Brophy J. 2007, p. 65). Of course, some information and guidance have to be delivered by the trainer in an engaging way (activating their senses) – the more senses will be engaged the better learning retention we will get. Participants will remember it and they can be our "anchor points" helping us, for example, to activate pre-knowledge in future training (Kutschenreiter-Praszkiewicz I. et al., p. 51).

The "less means more" rule suits here perfectly. It is better to master knowledge chunks than only make poor attempts to acquire more information. That rule should also be applied to presentations – we should avoid overloading slides with too much content. The transparency of the information transmission is the key issue here. Communication skills are crucial for VR teachers as they greatly influence training efficacy (affecting participants attention, emotions and learning retention). *Think of it as the jewel in your crown (…) Communicate in a way that's truly electric, allowing people to see the most intelligent, trustworthy, and irresistible parts of your character. As you draw people in, forming more meaningful, authentic, and lasting relationships, you'll uncover even more opportunities for growth* (dalecarnegie.com).

We can say that VR teachers need to use their voice and avatar-gesture in the optimum way in order to create lasting impression and use a variety of presentation styles selected for specific audiences.

Try to make great opening (especially if you are unable to fully use your body language in VR) and to know participants of your training (let them introduce themselves), later on leave them space for collaboration with the use of activating methods. Remember to use language (also avatars' body language and gestures) adequate to your audience – to be well understood.

All presentations should be planned and structured with respect to the training goals and methods. Presentations should be given to participants in an attractive way adapted to the needs (of organizers and attendees). Presentation is a function of quality of trainers work and programme content with strong regards to the transmission's originality level and intensity (including dynamics adapted to the

participants emotions and arousal level). Trainers should prepare presentations with regard to certain goals (not only of the training programme, but also of participants) – taking their goals into consideration will enable us to engage them more actively.

There are different clasifications of presentation styles (techniques that are used) indicating from four up to even dozen kinds of them. If the trainer's task is to deliver one presentation, he/she can choose one that suits best, if there is a whole training to conduct surely there will be a need to choose a few of them and combine with reference to the goal and trainers' personality.

Summary *(conclusion for practice): Training environment is an important factor for the quality of the delivered workshop. It is also a factor that can be an ally or enemy of the trainer. It is far better to know the "ground" of the training and be able to use it as an advantage (we don't fear the things we know). VR classroom should enable to be focused and creative, to be eager to perform and share our experiences. The other thing is to keep participants in the proper engagement with accurate level of stimulation and different presentation styles connected with topic and trainer's personality should help us to achieve optimal level of attendees concentration. Training styles should be selected with regard to the complexity of topic and trainers' personal qualities of character. Remember to take into account presentation styles suitable for distant learning.*

Exercise 1.

From the descriptions below, choose three (3) features that characterise training and are correct.

Proposed features	Training features
a) Training should be planned well in a logically structured manner with gradation of difficulty of topics and consideration of substantive links between them. b) I-Labs are deliberately created spaces (rooms) arranged in a certain way (e.g. wall murals) with special objects that link us with this environment and even sounds helping participants to be creative. c) VR teachers have to have proper appearence, be elegant and wear fine clothes when entering the VR environment. d) Presentation is a function of quality of trainers work and programme content with strong regards to the transmission's originality level and intensity; e) Trainers should prepare presentations without any regard to certain goals of the training programme or difficulty of topics.	

Progress test

Are you able to:	Yes	No
a) Indicate potential positive and negative sides of the training taking place at the workplace?		
b) Give examples of situations during the training where the level of the stimulation is too less and too low?		
c) Name at least three presentation styles?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Chapter 9. Training methods, forms and techniques in VR

The brain is hardwired to forget

T. Maddox

9.1. Methods and forms in adult education with the use of VR

The need to use active methods rather than traditional ones results from the objectives of the training contained in the module (described in learning outcomes). A future VR teacher should be able to solve various problems, show pro-active attitude and initiative and be decisive and communicative. The effectiveness of training methods can differ and it should be taken into account when designing the programme or training materials and thinking about the organisation of the process. It is useful here to look again at the *Dale's Cone of Experience* (Figure 3) and at *the Cone of learning retention* (Figure 4). They show that less effective methods are passive ones like lecture (5%), reading (10%), demonstrations (30%), while working in small groups gives about 50% of efficiency, experimental work and learning by doing about 75%, case studies, projects prepared with others, learning with colleagues and teaching/training others may bring 90% of efficacy. The most useful methods are those that give us an opportunity to retain knowledge, skills and competencies. *The brain is hardwired to forget* is the statement by Todd Maddox from the University of California in Santa Barbara that indicates that human memory has limited capacity for storing information. Information that is to be given by the teacher or trainer in order to be stored in long-term memory should be focused on factors that make it attractive (preventing from being forgotten). Three most critical elements (that prevent forgetting) are required: high-quality training, engaging content, and optimised training procedures. Process should also refer to "spaced testing" and "targeted retraining" (Maddox T. 2017).

Tests and targeted retraining sessions stimulate long-term memory storage, enabling learners to keep the acquired information

and even recall it (with some techniques as, e.g. activation of pre-knowledge).

Figure 7. Forgetting curve
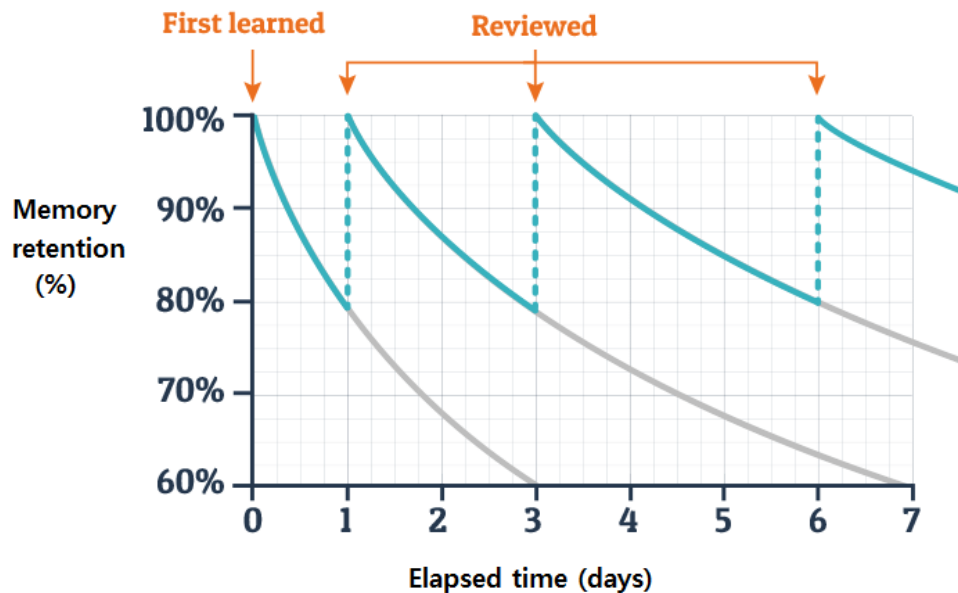
Source: https://www.researchgate.net/figure/Ebbinghaus-forgetting-curve-and-review-cycle_fig1_324816198

Tests and retraining should, however, be repeated a few (even three or four) times so that *less and less information must be retrained, and forgetting is nearly absent* (Maddox T. 2017). It is reflected in *Figure 8. Learning retention with reference to teaching/training others*.

Figure 8. Learning retention with reference to teaching
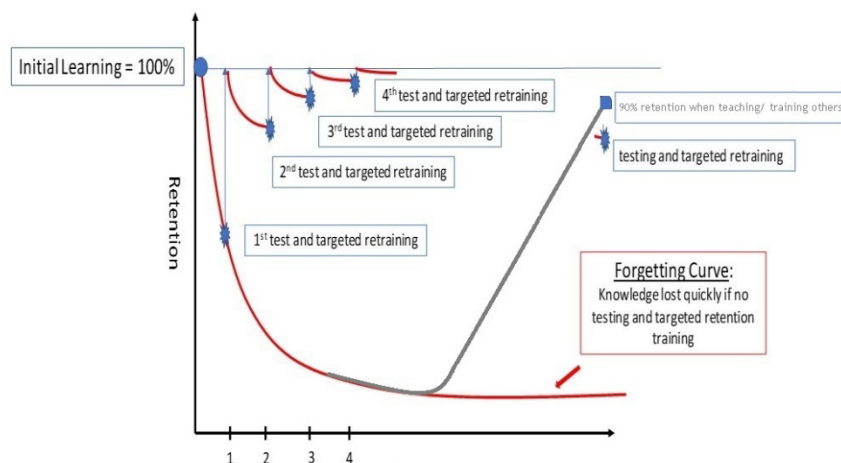
Source: Stępnikowski A. (2022) based on Maddox T. (2017).

VR teachers should learn themselves and use active methods when teaching others. It is important for trainers to be able to deliver to participants' content that will enable them to integrate knowledge from different fields and use various sources of information with the ability to plan independently, make decisions and work in groups.

When training future VR teachers, we should also remember about the forms of learning, i.e. educational activities specified by the programme, and the organisational and methodical approach (Aleksander T. 2009, p. 384).

Many such methods have been developed over the centuries (e.g. lectures and discussions developed in ancient Greece, meetings with experts (like famous travellers, politicians, researchers or artists), workshops, seminaries (organised for everyone who is interested in a particular topic), symposia (organised for professionals in a certain field), trips (educational, geographical, tourist), historical re-enactments and self-learning) (ibidem).

The most dominating organised form of learning, however, are "classroom lessons" (mainly school-based) and courses concerning interests of a particular group of participants. All those forms are conducted using a specific organisation and methodology (Aleksander T. 2009, pp. 385–388). Methods and forms of adult education are elements of "andragogy" which is also called "adult pedagogy" or "adult didactics". Training may use various specific methods and forms of learning based on the needs (goals) and accessible resources, and tailored to the programme.

There also are activating methods used to get more clarified ideas and/or to bring learners closer to the training topic, which, among others, include:

> **World café/Table talks** (find out more at: www.user-participation.eu);
> **Birds of feather sessions** (about 90–120 minutes) (find out more at: https://www.sessionlab.com/methods/birds-of-a-feather);
> **Campfire** (about 15 minutes) (find out more at: ttps://www.campfire-method.com/about/);
> **Solution room** (about 90 minutes) (www.conferencesthatwork.com).
> **dr Edward de Bono's 6 Thinking Hats method** marked with different colours (www.augumentedlearning.co.nz);

➢ **Walt Disney's rooms** (if we can have three different VR classrooms) – used for generation, assessment and implementation of plans. Disney's method lasts about 90–120 minutes (https://www.toolshero.com/creativity/walt-disney-method).

There is no ideal training that could be conducted only with activating methods, as there are some already identified barriers to using them, like:

- Systematic: domination of "to know" over "can" when we have a situation of "the process of teaching" instead of "the process of teaching-learning"; treating an attendee like an object;
- Resulting from the lack of resources: lack of manuals, limited possibilities of preparing materials for training, insufficient equipment and technological background with VR hardware (headsets) and software (apps);
- Related to learners' attitude: taking passive role in training
- Rooted in trainers' habits and lack of skills: lack of abilities to steer the group (to show the aims, motivate and lead participants), planning and preparation of training, excessive overload with programme/activities and lack of experience (limiting their competencies) and in the case of teachers sometimes there also may be bad attitude connected with treating teaching as a "dull or nasty duty", sometimes happen when trainer is pointed out by the institution against her/his will.

That is why the best approach is to combine activating methods with other forms, like:

- presenting (verbally), e.g.: tale, description, conversation, discussion, seminar, planning teaching and work with the manual (like this one) – using such learning forms as: lecture, talk, report, training, conference
- viewing e.g.: guided observation of things and phenomena or presentations of: objects, models, pictures, diagrams, and experiences – using such forms as: demonstration, films/multimedia, exhibitions.

When combining these methods with ICT solutions, we can speak about so called "**blended learning**". Future VR teachers should acquire core as well as professional and didactic competencies. Didactic competencies determine the use of selected methods, forms

and techniques for delivering information to participants with the inclusion of VR (communication) skills and *understanding of the social and professional roles performed* (Sałata E. 2013, pp. 81–90).

Diverse training techniques in VR include:

- teaching techniques using the CoViR tools and features;

- role-playing;

- activities in a virtual classroom;

- games and gamification; and

- ideas for group discussion and role-playing in the VR environment.

What could be useful is to **select an adequate combination of traditional and activating methods** including in particular case studies, brainstorming, problem-solving and projects. What can be recommended is also role-playing and workshops in small groups. It would also be interesting to go outside of strict pedagogics, incorporating experiences of communities of practices (VR teachers will create such a network after the project) and environmental education methods.

9.3. Assessment methods and evaluation in training

Examples of practical use in written tests (should integrate differentation difficulty levels of questions as there shouldn't be only easy or only very difficult ones):

- From the below answers, choose the most popular activating methods;
- Predict and list consequences of using only passive forms of training in a 6-hour-long course (open question);
- List three (3) main consequences/risks of a 3-hour-long VR training course;
- Explain the benefits of including active learning methods (open question).

Learners' achievements are always a central indicator of training efficacy (achievement of programme's goals), however, they are not the only one. Other important factors may concern attendees' satisfaction or return on investment (ROI).

Efficiency of the VR training (EoVRT) can be defined as a diagnosis of that, to which extent trainers perform to achieve goals that are expected from them, and to which extent participants achieve that, what should be achieved by them in the VR environment. The basis of the selection of the quality assessments are the training goals (general, specific) and rules of obiectivism used in VR. EoVRT is a function of several factors connected with the:

- [T] trainer (methods of teaching, methods of control and assessment, quality of training);
- [P] participant (methods of learning, quality of learning);
- [C] content of the training aligned with its goals; and
- [OVR] organisation and circumstances of the VR training process (Stępnikowski 2022, Jeruszka U. & Niemierko B. 1997).

$$EoVRT = f(T,P,C,OVR)$$

The aim of the EoVRT assessment is to set up valuable information from different sides of the participants of the process and use it in order to develop more adequate contents and materials before its implementation in VR Training.

This Certification Scheme for the certification of trainers as "Certified Meta VR Trainers" describes all procedures applicable to obtaining, assessing, issuing, maintaining, and withdrawing Certification of trainers in accordance with the requirements of the CYS EN ISO 17024:2012 Standard, the requirements defined in CCC's internal procedures and other requirements set by the project. The Certification Scheme refers to any trainer who wishes to demonstrate competency in the designated competencies for "Certified Meta VR Trainers" by achieving certification. More specifically, the Certification Scheme contains guidance and information for candidates to be certified and certified trainers for the following:

- the application and the process of assessing the persons for obtaining the "Certified Meta VR Trainer" certification;

- the criteria to be met for initial certification as "Certified Meta VR Trainer";

- the criteria for renewing certification and re-certification as "Certified Meta VR Trainer";

- the responsibility of the CCC for the evaluation, issue, use, maintenance, suspension and withdrawal of Certification;

- the obligations of partners concerning the assessment of trainers in each partner country, and

- the obligations of certified persons.

Certification is issued for a period of three years and the recertification process is described in the project certification scheme.

Summary *(conclusion for practice): Proper selection of training methods and forms is crucial to systemic education of teachers in the area of virtualisation. First experiences from the pilot project show that the mostly valued methods include case studies, problem-solving, workshops and projects, as they can be relatively easily transferred on the job (practical use). Training cycle is a systemic approach to the development, delivery and continuous improvement of a training programme with identified stages. Assessment and evaluation are its very important elements needed to be also included in the quality assurance context. It integrates several aspects of organisation and delivery of the training considering the training programme, participants' needs and progress, trainers' capabilities and competencies. It is not only important to know what to measure but also how to do it.*

Exercise 1.

From the descriptions below, choose three (3) features that characterise training and are correct.

Proposed features	Training features
a) Human memory has limited capacity for storing information. b) Less effective methods are passive ones like "lecture" or "reading". c) Training should be conducted only with the use of activating methods. d) Teachers can't use the role-playing method in VR. e) The main purpose of the training is to achieve "learning retention" understood as a possibility to convey information that will be stored in the long-term memory and maximally protect from forgetting.	

Progress test

| Are you able to:	Yes	No
a) Understand the main goal of the training (in general)?		
b) Name at least three activating methods and give examples of their application?		
c) Plan VR training integrating two activating methods ?		
d) Name the main functions of assessment and control measures?		

If you answered "No", we suggest that you go back to the chapter's learning content and analyse it again in order to achieve the assumed effects (knowledge, skills). Optionally, you can also consult additional sources of information proposed in the footnotes and bibliography.

Summary and policy recommendations

This guidebook should support the development of high quality community of VR teachers and trainers that will help "strengthen the capacities and tools to anticipate and address complex interconnected issues", identify and understand undergoing shifts and impacts, etc. That will enable them to acquire new trainer's competencies from the field of pedagogy/andragogy, psychology and didactics, making it possible to effectively share experiences and attitudes with other educators (with the use of VR).

This document also refers to COViR desk research conclusions, literature review and overview of good practices (IO1) regarding teacher training and education in the field of VR usage during classes (especially in the context of rapid changes that we see in a time of the COVID-19 pandemic). It is estimated that by 2025 VR global market will be valued at over 80 bn USD and it will be ahead of the TV market (Goldman Sachs). It is estimated that within that time, there will be 20.000.000 VR and AR devices in use (CCS Insight).

Figure 9. VR Headset sales
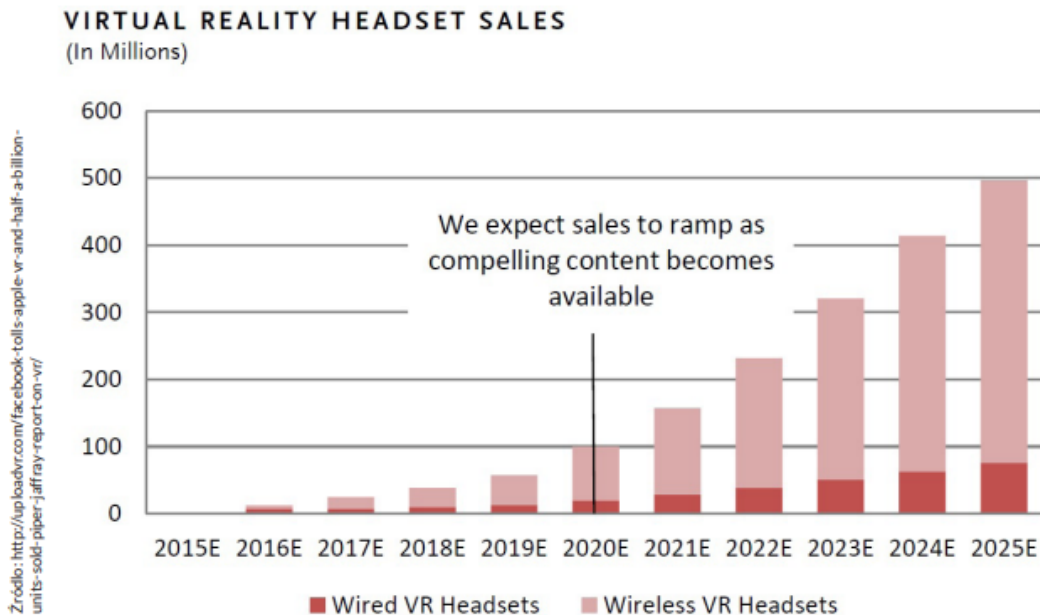
The most interesting for VR users (so far) are the following activities: having an pre-view of subjects in real sizes and shapes while buying them online (64%), VR maps on smartphones (62%),

watching movies around us (57%) and 33% of respondents would like to go on a VR date (Bluerank). Despite the fact that there is plenty of reports on distant learning efficacy (or lack of efficiency) especially in the pandemic context. There are many reports and articles on:

a) COVID-19 challenges (N. Pikuła, K. Jegielska, J. Łukasik, Kraków 2020; E. Pisula, D. Pankowski, I. Nowakowska…, Warsaw 2020),
b) Digitalisation of education (i.a. Polish Economy Institute, policy Paper 6/2020),
c) Distant learning (i.a. G. Ptaszek, G. Stunża, J. Pyżalski, M. Dębski, M. Bigaj, Gdańsk 2020),
d) Teachers' wellbeing and attitudes in a time of the pandemic (i.a. B. Jankowiak, S. Jaskólska, Poznan 2020).

There are also some reports and articles on digital and communication competences of teachers (i.a. PARP 2020; M. Piechowska, S. Romanowska, 2020 and regarding "media competences" M. Janta, 2020). On May 19, 2021 new qualification designed by the Ministry of Education and Science was published with regards to teaching with the use of tools for distant learning (added to level 5 of the Polish Qualification Framework (Journal of Laws 474, 2021) but there is a lack of data regarding VR tools used by teachers (and trainers). In Polish context there is general data collected on 100 teachers group and 300 students plus Bluerank research that says that: 64% of kids uses mobile devices, 97% students are satisfied of VR being in use during classes and 85% of teachers agreeing that VR has positive influence on students (edukacjavr.pl). So there are no results based on a big research group available in Poland or in other partners' countries. In primary schools, VR lessons are connected i.a. with geography and biology (continents, oceans, space).

The COViR Teachers' Guidebook can be the first attempt to equip VR teachers/trainers with proper knowledge and increase their awareness in that area (supplemented by the COViR e-learning course). The success of the project's long-term effects to a great extent depends on VR teachers' values, attitudes and ability to self-learn. This guidebook serves that purpose, giving a compendium of

methods and techniques that can be supportive in diverse educational situations with use of VR. It is recommended to:

➢ give VR teachers some possibilities for certification of their competencies (i.a. open badges or micro-credentials), here named "**Meta VR trainers**";
➢ establish an international community of certified VR teachers and trainers.

We hope that you will find this Guide successfully integrating the concept behind selected training materials, methods, and digital tools to provide usage guidelines, manuals, as well as policy recommendations in order to serve as a useful study for the exploitation of VR collaborative training in modern VET practices.

With regards to the policy recommendations we are looking upon ministerial executive acts on the standards of preparatory education for professional teachers and VET instructors. In Poland, for example, this could be the Regulation of the Minister of Science and Higher Education of 25 July 2019 on the standard of initial teacher training, Article 3.7 of which states that *In classes B to F, the number of ECTS credits that can be obtained within education using distance learning methods and techniques, may not be greater than 25% of the sum of the ECTS credits determined for these classes groups. Apprenticeships may not be conducted using distance learning methods and techniques*. That regards to psychological and pedagogical preparation of teachers (pedagogy, methodology of teachers work). In our opinion it should be indicated that distance learning methods and techniques should include VR and AR.

The same goes in the context of pedagogical preparation of people that don't posses pedagogical empowerments - we point out that way of their preparation should also be educated with the use of VR/AR technologies as they are becoming more and more popular. That kind of pedagogical preparation mainly has the form of post-graduate studies and lasts for three semesters. Last but not least, learning and teaching in the VR/AR environment should be namely indicated also in the pedagogical courses for VET instructors (lasting for 48 hours, including eight practical training classes that should also be conducted in virtual or augumented reality). Such solutions

should also be connected with applicable national recommendations on microcredentials proposed by the Council of the European Union.

Another case of Cyprus also shows that the use of VR and AR is not considered as an official method of learning by the Ministry of Education and Culture and Cyprus Goverment yet.

However Virtual Reality and Augment Reality is a very „hot subject" at the moment. Different projects take place that use Virtual Reality as a mean for learning. One such a project is VR TEACHER and its aim is improve digital Competences of teachers (https://www.vrteacher.eu/) and another project is one for using VR in high schools in Cyprus for learning Physics (https://www.cyens.org.cy/en-gb/media/news/immersive-vr-for-learning-physics-in-the-high-scho/).

Some Universities also do research on Virtual Reality and try to find out what are the implications of VR and AR in education (VR and AR - Institute For the Future (unic.ac.cy))

Therefore we see that there is interest in using Virtual Reality for Learning in Cyprus. We believe that the Minisitry of Education and Culutre should think about Virtual Reality seriously and consider it as a mean of learning.

It is worth to remember main benefits of VR for Education such as:

1. **Enhance student engagement**: Students can experience learning and actively participate in the lesson with virtual reality

2. **Increase knowledge retention**:Virtual reality fully immerses students and completely focuses their senses on the teaching topic. When experiencing topics as if they're reality, this helps them to improve knowledge retention by up to 75%.

3. **Improve students learning outcomes**: Experiential learning with virtual reality benefits a range of student outcomes. With engaging, individualised experience can improve student understanding, attainment and even increase test scores by up to 20%!

4. **Develop collaboration and social skills**: Virtual reality improves teamwork and social skills through creating exciting, collaborative learning environments

5. **Build empathy**: Teachers can genuinely put their students into other people's shoes with virtual reality. By helping students to see life from different points of view they build empathy.

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List of correct answers for exercises to be done by readers

Exercise for the chapter	Correct three answers	Exercise for the chapter	Correct three answers
I.	a, b, d	VI.	a, b, d
II.	b, c, e	VII.	a, b, e
III.	b, c, e	VIII.	a, b, d
IV.	a, b, e	IX.	a, b, e
V.	a, c, e		

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