

VIRAL SKILLS COMPENDIUM



*Fostering **V**irtual **R**eality applications
within **A**dult **L**earning
to improve low skills and qualifications*

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Table of contents

Introduction.....	1
1 Technical Introduction to Virtual Reality.....	3
1.1 Virtual reality in the educational sector	4
1.2 Core statements of VR experts.....	7
2 VR and Learning – A Pedagogic Point of View.....	9
2.1 State of the Art of Academic Discussions.....	9
2.1.1 Current discussions about VR in adult education	10
2.1.2 Past approaches to virtual reality and adult learning	11
2.1.3 Virtual reality in adult training	13
2.1.4 Virtual reality in education – a general approach.....	14
2.1.5 Virtual reality and low-performing students.....	16
2.1.6 Virtual reality for low-skilled and low-qualified adults	16
2.1.7 Challenges and prospects relating to the educational use of VR.....	20
2.2 Recommendations for Setting up a VR Training Course	21
2.2.1 Training low-skilled and low-qualified adults and VR – general aspects to keep in mind ...	22
2.2.2 Setting up a VR training course – key questions to consider	23
3 Country Comparison.....	30
3.1 The state of the art in VR learning within the EU.....	30
3.2 VR learning and development in Asia (Japan and China).....	31
3.3 VR in the USA.....	33
3.4 VR examples and low-skilled learners	33
4 Target Group Survey Results	36
4.1 Introduction and background.....	36
4.2 Methodology	37
4.3 Quantitative survey results (selected examples)	38
4.4 Qualitative survey results.....	42
4.5 Summary, deductions and recommendations	44
References.....	47
ANNEX: Viral Skills E-Thek	1

Introduction

A handbook for Adult Educators and Trainers

The trend of digitalisation has entered all levels of public and private life and is also revolutionising adult education and training. According to *Forbes Magazine* technologies like Virtual Reality (VR) will transform teaching and learning processes to a large extent in the near future. This is connected with recent technical advancements which make this medium not only cheaper but also more efficient and viable for practical use. Nevertheless, until now there was no comprehensive practical guidelines or pedagogic compendium for the application of VR in adult education.

With the **Viral Skills Compendium**, the international team of the Erasmus+ project Viral Skills, with members from Austria, Cyprus, Germany, Ireland, Italy and Spain, aims to support managers and teachers within adult education to tackle the challenges of implementing VR within adult learning. Based on an initial research approach (see [‘Viral Skills Survey Report of VR Applications’](#)) where existing and emerging hardware and software technologies in VR have been analysed, important technical as well as pedagogical information has been gathered to provide a comprehensive guide on how to apply VR in the best possible way within adult education in general, and in particular within training for low-skilled and low-qualified adults.

In this context the **first chapter** of this Viral Skills Compendium provides a technical introduction to VR, summarising the main outcomes of the Viral Skills Survey about the state of the art in VR.

The **second chapter** constitutes a comprehensive pedagogical part. This key chapter presents information about current academic discussions concerning VR in education, particularly in adult education. It will also offer key questions, guidelines and recommendations to guide adult educators (especially those working with low-skilled and low-qualified learners) when setting up a VR training course in their educational contexts.

To gain insight into developments, trends and standards concerning VR in education in Europe and elsewhere, a country comparison is provided in **chapter three**.

As part of developing this compendium, a qualitative survey of adult education providers was carried out. The survey aimed to gain an overview of educators’

frameworks, needs and demands as well as their fears, doubts and reservations concerning the use of IT applications in general and specifically when considering using VR in their classes. The results of this survey are presented in **chapter four**.

Besides the compendium, another core element of the Viral Skills project is the 'Viral Skills E-Thek'. The E-Thek is a compilation of more than 20 free VR software applications and VR learning programmes recommended by the Viral Skills project partnership for adult learning settings, specifically for activities with low-skilled and low-qualified learners. These VR applications have been intensively tested and analysed, and are described in 'VR application profiles'. The comprehensive Viral Skills E-Thek can be found in the annex of this compendium.

1 Technical Introduction to Virtual Reality

Virtual reality (VR) software and hardware solutions are gaining importance in many different sectors of society.

Various technologies are already being widely used in other industries, paving the way for future use within education. Nepal and Tang (2017) suggest that 'today the Virtual reality (VR) technology is applied to advance fields of medicine, engineering, education, design, training, and entertainment. VR is a computer interfaces which tries to mimic real world beyond the flat monitor to give an immersive 3D (Three Dimension) visual experiences. Often it is hard to reconstruct the scales and distances between objects in static 2D images. Thus, the third dimension helps bringing depth to objects.'

Academic literature provides many different definitions for the phenomenon of VR. The reasons for this different understanding of the term lie in different user environments and settings, various areas of application, and focuses on different aspects of ergonomics. Luckey (2012), founder of Oculus VR and developer of the Oculus Rift system, indicates that VR is best understood as a stereoscopic perspective with increased visual range, which creates a feeling of diving into a different world. The feeling is often described as *immersion*, which Sherman and Craig (2002) pinpoint as one of four key elements in the formation of a true virtual experience. Yet, for a true immersive impact, further elements are important: the virtual world itself, the sensory feedback and interactions between the elements of the virtual world and the user. These elements are key in forming a true virtual reality. Contrary to a true perception of reality, VR allows the user to choose and change between different positions (within the virtual world) and points of view on elements of the virtual world. By doing so, events or occurrences of the story within the virtual world can actively be influenced and co-created (Zobel et al., 2018, and Sherman and Craig, 2002).

The main differences between VR and other environments, such as augmented reality (AR), are that VR devices have completely shut cases and their lenses are adjusted in front of their various screens – two criteria considered important for achieving full immersion into the virtual world, without users being distracted by real-world light (Zobel et al., 2018).

Woodford (2019) further outlines that a virtual reality experience is distinguished from a usual computer experience by the system of input and output. While computer-based experiences use a keyboard, mouse or speech recognition for input, VR technologies use sensors for detecting body movements. The output is displayed on one single screen in a computer-based environment. However, virtual reality uses two screens – one for each eye – and further incorporates sounds (e.g. via headsets) and haptic feedback via controllers in the headsets for a more realistic and immersive experience.

Woodford (2019) summarises that essentially VR needs to be:

- **Believable:** The user really needs to feel like they are in a virtual world, or the *illusion* of VR will disappear.
- **Interactive:** As the user moves around, the VR world needs to move simultaneously.
- **Explorable:** A VR world needs to be big and detailed enough for the user to explore. As Woodford (2019) further pinpoints, although a painting can also be realistic, it only illustrates one scene, from one perspective. A book can also transport the reader into a 'virtual world', but the user is essentially only able to explore this world in a linear way.
- **Immersive:** To be believable and interactive, VR needs to engage both the user's body and the user's mind. Paintings by artists can give the observer a glimpse of a scene or historic event, but the viewers can never fully experience the sight, sound, smell, taste, and feel of that scene or event.
- **Computer-generated:** Only powerful machines with realistic 3D computer graphics are fast enough to create believable, interactive and alternative worlds that change in real time as the user moves around them.

1.1 Virtual reality in the educational sector

Digitalisation trends have reached the field of education and are revolutionising teaching and learning processes on all educational levels. One of the core aims of the Viral Skills project is to integrate innovative technological approaches into the areas of adult education and to facilitate and increase the widespread utilisation of

VR technology in this field, especially as a potentially motivating medium for low-skilled and low-qualified adults.

By conducting an international survey on available and emerging VR technologies and leading interviews with VR experts in all partner countries, relevant findings and assessment about the applicability of VR technologies in educational area were gained.

In total, 12 hardware systems (Oculus Rift, HTC VIVE, HTC VIVE Pro, Samsung Odyssey, Lenovo Explorer, Dell Visor, Acer AH 101, Samsung Gear, Google Daydream View, Oculus Go, Lenovo Mirage with Daydream, Oculus Quest) were evaluated against the aims of the project, with respect to their:

- market presence
- various supporting media
- average purchase costs
- hardware and software requirements
- technical specifications
- functionality
- simplicity and handling
- accessibility.

The following overview, subdivided into three main areas, provides a deeper insight into the topic.

1.1.1 PC-based VR devices

According to the various technical elaborations of PC-based VR devices, general commonalities, differences, advantages and disadvantages do exist. In comparison to the other devices, the HTC VIVE and the HTC VIVE Pro are the most expensive solutions. However, in terms of quality, performance, functionality and simplicity both devices offer outstanding capabilities. The average purchase costs for the Oculus Rift are reasonably low; however, in terms of performance, hardware requirements and functionality the device does not offer evenly high standards like the HTC solutions. Yet, it is proposed that the Oculus Rift offers a better price–performance ratio. Both the HTC systems and the Oculus Rift can be used on various VR software environments such as Windows, macOS and Linux. Instead, Dell, with its Visor solution, the Lenovo Explorer, the Samsung Odyssey and the Acer AH 101 are based on Windows Mixed Reality, which Milgram and Kishino (1994) define as a 'reality

spectrum' ranging between pure 'reality' (without computer intervention) and pure 'virtual reality' (a computer-generated environment). Mixed reality (MR) is any environment that incorporates aspects of both ends of this spectrum, such as overlaying virtual objects on top of a user's view of a real space. Devices using Windows Mixed Reality software are, according to industry experts, easier to set. Yet, in terms of overall performance, Windows-based solutions are suggested to be in an inferior position to all other manufacturers' solutions.

1.1.2 Smartphone-based VR devices

Smartphone-based VR solutions offer a stereoscopic vision by use of a smartphone, which is used as a VR display, for example by clipping the smartphone into a headset or a cardboard solution. With reference to the technical elaborations of the project partners, the Samsung Gear currently offers the best performance among smartphone-based VR devices. Although Google's cardboard solution offers a wide range of possible applications, it is, in technical terms, not an actual VR device, but more an enhancing gimmick that enables phones to give a VR-like experience. The Google Daydream View database is rather small in comparison to the Google Cardboard database. Yet, it offers a steady performance. In comparison to PC-based VR devices, smartphone solutions' major advantage is the ability to use and experience VR services anywhere at any time. Additionally, assuming a smartphone is already available, smartphone solutions are comparatively cheap by contrast with PC-based and stand-alone solutions.

1.2.3 Stand-alone VR devices

Stand-alone VR solutions such as the Oculus Quest, the Oculus Go or the Lenovo Mirage have an integrated display which is interlinked to the headset. In general, stand-alone solutions are regarded as superior to smartphone-based devices, as they usually have a higher performance and a better resolution. Yet, the focus of these systems is currently on gaming and entertainment, rather than applications in the educational sector. Yet, although stand-alone solutions presently have a relatively low presence on the market for VR devices, they are suggested to be well priced in comparison to PC-based solutions, especially as there are no further expensive hardware costs (e.g. for a PC).

1.2 Core statements of VR experts

Conducted interviews with 18 VR experts, within the Viral Skills project, confirm the growing significance of new technologies such as VR and AR (augmented reality) in the educational sector. Based on interview data collected in the six European partner countries, profound and useful information about the status quo of VR in general and its application in the adult education area was gained and evaluated.

Regarding the implementation of virtual technologies in the educational field, there is general agreement among the 18 European experts that some solutions are already applicable for educational purposes, although, it isn't completely technically matured.

The main **arguments for an integration of VR** solutions are that it allows:

- educators to teach in a more exciting manner
- users to visualise content and information not available in the classroom
- users to train for situations that are too expensive, dangerous or disruptive to train for in person.

The reported main **positive experiences** from VR implementation are:

- the possibility to combine VR with embodied technologies to combine two attributes – immersion and embodiment
- the possibility to build an immersive art workshop using mixed reality devices and immersive classrooms with the aid of an interactive monitor to allow a mix of a traditional and an extremely innovative teaching method
- better trainee engagement and better visualisation/engagement with real-life scenarios
- students enjoyed the VR experience
- VR technologies in business or educational scenarios foster engagement, motivation, excitement, creativity and positive attitudes towards the various topics
- in an experimental manner, VR solutions are perceived as being more realistic and efficient in delivering immersive experiences that entertain, motivate and foster positive attitudes of low-skilled and low-qualified learners towards the learning material.

Experts underline **relevant aspects** to which special attention should be paid when introducing VR into the educational process:

- The pedagogical strategy behind a first idea must be stringent, logical and well planned.
- It is important that learners are making their own experience with VR and immersive environments to minimise (possible) deficits in understanding.
- Criteria such as costs, accessibility, performance, usability, easy set up or reliability, the system itself and its purpose are to be considered when implementing VR systems for education.
- All tested VR devices can be considered as suitable for educational purposes, as most can be integrated easily into the educational environments.
- 6DoF (six degrees of freedom), describing the freedom of movement of a rigid body in three-dimensional space, is regarded as essential for delivering a superior immersive experience.

Summing up the statements of the experts, it can generally be said that VR technology has a high potential to revolutionise teaching methods and training efforts, and it will have a big and positive impact on the education of adult learners.

2. VR and Learning – A Pedagogic Point of View

'Augmented, Mixed and Virtual Reality' - these are according to a trend analysis on behalf of the German Institute for Adult Education the most discussed key terms 2018 in the field of further education (Lutz, 2019). It is due to the recent technical advancements that technologies like Virtual Reality become more and more viable and desirable in many domains, including education and training (Elmqaddem, 2019). Although the first virtual reality headset was already created in the 1970s in the USA and the actual term 'Virtual Reality' was proposed in the 1980s by the Jaron Lanier, back then several constraints prevented that these technologies were actually adopted by the general public. Today, VR technologies are finally mature enough and Virtual Reality is discussed from various disciplines including education science and related fields.

The following chapter will give an insight in these academic discussions specifically considering Virtual Reality from a pedagogic point of view. It will clarify advantages as well as challenges regarding VR in education and will further raise didactical and methodical questions which should be taken into account before any educational use of VR. By particularly considering the needs of low-skilled/low-qualified learners adult educators will be provided with recommendations and guidelines concerning the practical implementation of Virtual Reality in the educational field.

2.1 State of the Art of Academic Discussions

Recent discussions among academic experts clearly show that the interest in applying virtual reality in education is increasing. With the proliferation of new affordable hardware and software, VR promises not only new teaching and learning models but also a medium that better meets the needs of the 21st century learner (Elmqaddem, 2019). When it comes to learning in virtual environments and its potential, academic discussions go back to the 1990s. At that stage William Winn and Randy Jackson were some of the first researchers to try to provide a conceptual basis for educational applications of VR (Winn, 1993). They stated 14 propositions about educational uses of VR (Winn & Jackson, 1999). Most of these propositions are still highly topical. According to Winn and Jackson (1999) virtual learning environments support constructivist concepts of learning, allow simulation of concepts that are normally not assessable to the senses, and enable learning and

training situations that may be too risky in the real world. Several researchers agree that VR-based training and learning can have significant advantages over traditional methods (Oh, Han, Lim, Jang, & and Kwon, 2018), although drawbacks and issues can also be found (Christou, 2010).

As to adult education little literature can be found that explicitly focuses on VR and adult learning. Nevertheless, recent discussions show increasing interest in this field also. The following chapter looks at present and past approaches to VR and adult learning, and provides a comprehensive insight into where academic discussions on this topic currently stand.

2.1.1 Current discussions about VR in adult education

As already stated above, a recent trend analysis revealed that 'virtual reality' was one of the most discussed key terms in 2018 in the field of further education. In social media adult education experts stress the potentials of VR as a medium that enables learning through experience, connects learning with fun and can be highly motivating. They also discuss drawbacks like motion sickness, and needs in practice. Although an interest in using VR in the field of education is a given, according to experts the medium is still at an experimental stage. For now, it is the technology itself and the fascination about it which is in focus. However, in order to become a learning medium that will survive long-term, emphasis has to be laid on didactical concepts and practical guidelines. According to experts this will be the challenge of the near future (Lutz, 2019).

Similar considerations can be found in Canada where Oh, Han et al. (2018) recently discussed the potentials of AR and VR in the field of adult education. By referring to successful applications of VR for military and medical purposes, the article tries to provide new insights and future direction of VR/AR uses in adult learning and education for scholars as well as for adult learners. Although they consider AR and VR as potential learning tools to facilitate effective learning in various adult education fields, they stress the need to pay more attention to these new immersive technologies. 'Despite the recognized significance of using VR and AR,' they say, 'there have been no conceptual or empirical studies examining the implication and influence of VR and AR in the field of adult education' (Oh, Han, Lim et al., 2018, p. 2). According to them, researchers still have to investigate which type of VR/AR and what kind of VR/AR apps are most effective to deliver adult learning programmes.

Furthermore, researchers must not only focus on adult learners' characteristics and learning styles but also identify benefits as well as limitations of VR and AR used in adult education contexts. Only then can valuable guidelines and reference tools for existing practices of VR- and AR-based learning be provided.

According to the authors, VR is expected to provide adult learners with great access to learning resources and enhanced motivation for learning through lifelike experiences, and can help reduce overall learning costs and time. Considering these positive effects of VR, Oh, Han et al. (2018) recommend fostering further investigations into the use of VR in adult education. More comprehensive discussions in this context can be found in the USA and France. These discussions are summarised in the section below.

2.1.2 Past approaches to virtual reality and adult learning

In 2009 Professor Kenny Ott at the Valdosta State University (USA) studied VR in adult education and discussed VR as wonderful element that could enhance any traditional business classroom. In his report *Virtual Reality and Simulation in Adult and Career Education* he gave brief examples of how VR and simulations could be integrated into education. For Ott, using VR as a learning medium was definitely more engaging than simply reading a text or sitting in class. To better understand the potentials of VR for educational contexts he referred to Winn and Jackson (1999) and their 14 propositions, already mentioned above. Although in 2009 VR was no longer an expensive technology tool, according to Ott the application of VR in adult and career education was still in its infancy (Ott, 2009).

A more comprehensive analysis of adult learning and VR was provided in France by Mellet-d'Huart in his article 'Virtual Reality for Training and Lifelong Learning' (Mellet-d'Huart, 2009). In this context Mellet-d'Huart gave not only an overview of existing VR applications in this field, but also a design approach, as well as recommendations for developing virtual environments that should especially suit the requirements of adult learning. Overall, the article focuses on the uniqueness of VR and its characteristics. In terms of training and work-based learning Mellet-d'Huart referred to a number of unique advantages that VR has over traditional training methods: since VR can create safe environments for training and learning, it allows:

- rehearsal of emergency situations

- skill acquisition for hazardous tasks
- learning to operate, maintain or repair unavailable machines and equipment
- training for situations where conventional on-the-job learning is impossible, e.g. due to the risk of accidents or damaging tools.

All in all, VR enables training which would in real life be too dangerous, too expensive or simply unachievable. However, according to Mellet-d'Huart, VR could be used to enhance training situations even when feasible in the real world. For easier and more effective learning, VR-learning environments could provide different feedback and replay functions, multiple scenarios, close adaptation to learners' activities and a lot more. Although the author referred to the fact that VR training has been proven effective, he also pointed out that when it comes to using VR for learning in general, not all experimental results had been so straightforward in the past (Winn, 2003; Winn, 2005). According to Mellet-d'Huart, possible reasons for this include insufficient consideration of learning concepts and/or of VR's uniqueness when designing applications, and/or a lack of adequate design methods. Such shortcomings had to be addressed. In 2009 Mellet-d'Huart believed it was the learning sciences specifically that should develop new concepts, analyse learning processes and consider methods for designing learning resources, so that VR-supported learning could be as effective as possible.

Looking at current discussions, it seems that Mellet-d'Huart's earlier considerations were relevant in terms of this call for a more pedagogical point of view and his emphasis on VR's uniqueness for adult training. VR and training seems to be a frequently reported topic. According to a literature review on immersive virtual reality in education (2015), most papers can be divided in those that refer to high school and university education and those aimed at adult training in special fields. Many papers about VR applications in medical, military and industrial training are available (Freina & Ott, 2015). In transportation VR flight and driving simulators seem to be successful (Christou, 2010). As a quite recent contribution to VR in the field of adult training the article of Zobel, Werning, Metzger and Thomas (2018) can be mentioned as a reference point. The authors name applications of VR in education and training in the German-speaking world. Focus is also on chances as well as limitations which can be found in these fields.

2.1.3 Virtual reality in adult training

In the education and training fields interest in AR and VR has grown due to recent technological progresses and the proliferation of affordable hardware and software. Schools, companies, universities and military training centres are all beginning to realise how VR can enhance their training. Nevertheless, problems, challenges and constraints are also discussed. Zobel, Werning et al. (2018) examine the state of the art in these fields, providing a more comprehensive point of view of VR than many others.

As to education and training in the industrial/production sector Zobel, Werning et al. can state similar benefits to Mellet-d'Huart's. Using VR means saving costs and resources, and reduces the risks for those who learn. Although VR training and education is increasing, results of surveys are not that straightforward. When it comes to the implementation of VR in companies, at least in German-speaking Europe, not all representatives seem convinced. There is criticism of the costs, which seem still too high, as well as of the medium itself and its missing social components. Despite all that, advantages could outweigh the drawbacks on one condition. Referring to Katzky (2012) Zobel, Werning et al. think that VR should complement rather than replace any training of adults with real machines (Zobel, Werning et al., 2018). Recent developments indicate that the criticisms might be already obsolete. Nowadays qualitative hardware is more affordable (Elmqaddem, 2019), and so-called social virtual realities exist, allowing multiple users to interact in the same virtual world (Klampfer, 2017).

In medicine there is a significant percentage of papers reporting applications in the medical fields. Here, VR has been widely used at very different levels, from nurse education in a collaborative immersive system, to medical training in a virtual hospital, to simulation of surgical procedures and training with expensive instruments like endoscopes (Freina & Ott, 2015; Elmqaddem, 2019; Zobel, Werning et al., 2018). In this context Zobel, Werning et al. specifically stress the potential of VR's replay function. It allows VR training situations to be repeated as often as required and without risk to patients or damaging medical tools. However, a challenge lies in creating realistic simulations. Klampfer (2017) states in this context that it is important that the knowledge and competences gained in the virtual environment can be transferred to new (real) situations. Although a successful transfer of training in VR is already demonstrated in emergency medicine, Zobel, Werning et al. refer to Riener

and Harders (2012) who stated that a lot more research was needed to examine these effects in other medical fields.

Finally, Zobel, Werning et al. also report about successes in the military sector, where student pilots benefit from VR flight simulations, and where VR in general can be useful for role playing and training operations within a safer environment (Zobel, Werning et al., 2018).

Although the latest technological advancements have now made VR more accessible to the general public and trainers, discussions about VR learning have a long history and are still relevant today.

So far in this compendium several advantages and drawbacks of VR in the educational field have been discussed. The following sections provide an overview of the state of the art in VR.

2.1.4 Virtual reality in education – a general approach

According to academic discussions VR can improve and facilitate traditional learning in a variety of ways. In general VR allows users to visualise contents in a three-dimensional (3D) space. It enables interaction with objects and people in the virtual world. These worlds may be realistic or imaginary, macroscopic or microscopic, and based on imaginary dynamics or on realistic physical laws. The multitude of scenarios that VR can depict makes it broadly applicable to many education fields (Christou, 2010). In this context Klampfer (2017) provides various examples of VR's potentials.

Firstly, Klampfer states the potential of *virtual teleportation* which seems to extend the boundaries of a traditional class. For example, in Geography, Biology or Art Education learners can be transported from classrooms to places which would be too far away, too dangerous or inaccessible without the virtual world. In VR learners can either passively observe 360-degree videos and/or photos, or even actively discover and explore the contents shown. In this context VR can reconstruct ancient cities and cultures and bring historical events back to life. VR applications (apps) range from virtual tours of galleries and museums, to flora and fauna in Australia, to exotic expeditions to any place on earth.

Secondly, Klampfer refers to VR *simulations* whose unique potential for training of adults is already mentioned above. However, VR facilitates didactic learning

scenarios that would be otherwise impossible without VR – not only in medical, military and industrial contexts but in all educational fields. VR simulations can be carried out independent of time or place, be repeated as often as required and can also (re)construct situations from the future or the past. By using didactic reduction even complex processes and difficult content can be easily understood. VR can make use of time-compression or time-stretching, hide irrelevant details, show interdependent factors or boost learning by the manipulation of objects and their relative size.

Thirdly, apart from simulation and teleportation Klampfer also stresses potential for *communication and cooperation*. According to his article, VR can also be used as 'social virtual environments' (Klampfer, 2017, p. 18). In these, VR makes it possible to meet other people (e.g. development teams), to exchange ideas, cooperate on projects and even interact with objects in the real world. These social virtual environments could also become important for blended learning. For example, VR would offer excellent opportunities for language learning through users meeting students from other countries. Children forced to be absent from school for a long period of time might also benefit from VR.

Finally, VR could reinvent *art*. According to Klampfer, VR in art does not confine itself to virtual tours of galleries and museums. There are creative apps that allow students to learn art in VR and actively draw and paint in real-life size and 3D (Klampfer, 2017).

Discussions on theoretical basics can also be found when looking at approaches to VR and learning. Though Klampfer sees cognitivist as well as constructivist learning theories as potential learning models, most articles state constructivism as the ideal learning theory. According to Christou (2010) it is specifically the experiential nature of VR which supports a constructivist approach to learning. Students can learn from their experiences in the virtual worlds. In this respect VR may prove to be a powerful resource that can help in teaching by providing an environment that allows the student to experience scenarios, engage in authentic problems and explore solutions and situations rather than imagining them (Hu-Au & Lee, 2017).

Research shows that low-performing students in particular benefit from these experiences. In general, there is also evidence of the advantages of VR learning for low-skilled and low-qualified learners.

2.1.5 Virtual reality and low-performing students

In 1997 the potential of VR, particularly for low-ability students, was shown when psychologists and educational experts Winn, Hoffman, Hollander, Osberg, Rose and Char conducted an empirical study in which students built their own virtual environments (VEs) to learn various – mainly science-related – content. In 1997 psychologists and educational experts Winn, Hoffman, Hollander, Osberg, Rose and Char proved VR's potential, particularly for low-ability students. They conducted an empirical study. Within the study Winn, Hoffman et al. examined the students' performance after learning by building and visiting VEs and also after learning the same content in more traditional ways. In the performance data they also looked for differences among low-ability and high-ability students. Results show that those learners who did not do well with a more traditional, symbol-orientated pedagogy improved academically, even more than their high-achieving counterparts, through learning with VEs. Whether this was due to the interaction, the immersive 'first hand' experience or the opportunity to learn content without an abstruse and abstract symbol system remains to be determined. The authors state that using VR seems to help students understand concepts and principles that they previously found incomprehensible and baffling (Winn, Hoffman et al., 1997).

Winn, Hoffman et al. focused their study on students in grades 4 to 12. Malo, Neudorf and Wist (2009), however, also see potentials for adult learners, especially those who are lacking in basic literacy and numeracy skills.

2.1.6 Virtual reality for low-skilled and low-qualified adults

According to an article by Malo, Neudorf et al. game-based VEs seem to be an effective method that allow visitors to acquire numeracy and literacy skills in an explorative, action-orientated way. Referring to Cromby, Standen and Brown (1996) and Standen, Brown and Cromby (2001), who state various advantages of VEs for learners with intellectual and learning disabilities, Malo, Neudorf et al. also see VEs as a promising medium for low-skilled and low-qualified learners. In their article they name multiple benefits. According to them interactive VEs would not only encourage active involvement in learning and give users the experience of control over the learning process, they would also allow for target group-orientated training

and could provide low-skilled and low-qualified learners with adequate tasks. But who are these low-skilled and low-qualified learners?

In defining low-qualified and low-skilled persons we can consider the established definitions provided by the International Standard Classification of Education in that low-qualified persons are those with basic educational levels (ISCED 0-2)¹.

Working with low-skilled and low-qualified adult learners requires educators to adopt a flexible and open manner and a willingness to facilitate learning using a range of different strategies to ensure positive enrolment and engagement in the learning process. These learners often approach education with a range of additional needs and barriers which can hinder their continued engagement in education and training. As such, working with these 'non-traditional' learners means that educators first need to understand some of the unique characteristics associated with this target group.

Representatives of these target groups can be found in classrooms and learning settings across Europe and are often identified as:

- **Refugees:** A refugee is anyone who cannot return to their country for fear of persecution for one of the following five reasons: race; religion; nationality; membership of a particular social group, gender, sexual orientation; political opinion, etc. Refugees are entitled to be protected against forcible return to their countries of origin.
- **Migrants:** An international migrant is someone who changes their country of usual residence, irrespective of the reason for migration or legal status. Generally, a distinction is made between short-term or temporary migration, covering movements with a duration between 3 and 12 months, and long-term or permanent migration, referring to a change of country of residence for a duration of one year or more.
- **School drop-outs:** A school drop-out is an individual leaving high school, college, university or another group for practical reasons, necessities or disillusionment with the system from which they leave.
- **Long-term unemployed,** etc.

¹ 0 = pre-primary education; 1 = primary education or first stage primary education; 2 = lower secondary or secondary stage of basic education

The characteristics of these adult learners are clustered and presented below:

- Adult learning tends to be **selective**, in that adults will learn what is relevant and meaningful for them. As such, adults will not learn for the sake of it, and it is important that educators appreciate this, and try to contextualise the learning content so that it is relevant to the individual adult learner.
- Adult learning contains a degree of **responsibility** and is **self-directed**. This means that adults take responsibility for their learning, and are able to identify their training needs, set learning goals and organise their learning to achieve these goals. When working with low-skilled and low-qualified adults, it is important for educators to lead learners through the process of developing this self-awareness and responsibility if they are lacking this competence.
- Adult learners have **experiences** achieved outside of the classroom. Adult learners often have vast real-life experience, other commitments and responsibility and a set of attitudes and beliefs that have been cultivated through their experiences; as such they expect that educators will treat them as adults.
- Adults tend to learn best through a **problem-centred approach**. Adult learners tend to have most interest in content that has a direct application in their daily lives, especially where learning can help to solve a problem which exists in their life.
- Adult learners have typically been away from the classroom for an extended period of time; as such, they may need **additional support** to develop their self-confidence and self-esteem, especially considering that many of them may also have previously had a negative experience with education.

These characteristics help to build the rather typical profile of a 'non-traditional' adult learner group comprising low-skilled and low-qualified learners. In addition to appreciating the unique characteristics of these adult learners, it is important that adult educators adapt different strategies and approaches to work effectively with these learners.

In order to develop effective adult education programmes that instil the drive in learners to continue and attain their education goals, research conducted by Bryson (2013) suggests that educators should adopt a 'principle-based approach' to curriculum design and delivery. The principles Bryson advocates include instilling in

adult learners a set of beliefs and attitudes which motivate and support them to succeed.

The central message of this research is that rather than expecting 'uniformity', educators working with low-skilled and low-qualified adults (refugees, migrants, school drop-outs, people who have been long-term unemployed) have to strive for 'multiformity'; this means revising traditional models of adult education which adopted a 'one-size-fits-all' approach, and instead tailoring the learning experience to appeal to the needs and preferences of our increasingly diverse adult learner population. This might be easier said than done; but as a starting point for adopting this approach to engaging low-skilled and low-qualified adult learners in education, Bryson advises educators to begin each training programme by familiarising themselves with the characteristics of their learning group and considering a range of supports that could be specific to learners in the group.

As already stated above, one supporting medium might be VR. According to Döbert and Hubertus (2000) often another characteristic of low-skilled and low-qualified adult learners is constant fear of social exclusion and exposure. In their article Malo, Neudorf et al. (2009) describe VEs specifically in this context as a unique medium for learning. VEs allow adults to learn by their mistakes and without suffering any real, dangerous or humiliating consequences of their errors. They could train for everyday situations, working at their own pace and receive consistent feedback on their activities in the VE (Malo, Neudorf, & Wist, 2009).

Finally, VEs are assumed to be highly engaging. Using VEs can not only support understanding and application, but also lead to more intrinsic motivation to learn (Malo, Neudorf et al., 2009). According to Elmqaddem (2019) learners would even feel more receptive. In fact, VR-based learning is proven to increase learners' level of attention by 100 per cent.

Although various educational experts agree that VR can be considered an enhancement of teaching and learning in the 21st century, its weak points are also addressed. The following section provides a short insight into some of the problems and criticisms discussed.

2.1.7 Challenges and prospects relating to the educational use of VR

When looking at the current use and integration of VR in education and training there are a number of challenges and problems that prevent VR tools from achieving their full potential. These include pedagogical, technical and economical limitations and even management issues. Although some problems were discussed in the past and might already be obsolete today, all are briefly presented below.

- **Simulator sickness:** One of the most discussed disadvantages related to VR seems to be 'simulator sickness', which can occur when using VR (Christou, 2010; Mantovani, 2003; Klampfer, 2017). Symptoms include dizziness, headaches, tiredness of the eyes and sickness.
- **Costs:** As already mentioned, costs can limit VR's penetration into educational and training contexts. In the past VR was seen as a relatively expensive alternative to conventional methods of teaching (Christou, 2010; Pantelidis, 2009; Mantovani, 2003).
- **Usability:** Mantovani (2003) and Pantelidis (2009) further mentioned usability to be critical. Due to the complexity of VR technology, students and teachers can find it challenging to learn how to use VR hardware and software.
- **Realism and Transfer:** According to Christou (2010), lack of realism was mainly a problem due to the initial visualisation used in VR. Fidelity and realism, though, are crucial for certain applications. In 2010 realistic environments combined with realistic dynamics and interaction, e.g. for surgical training, were still a challenge.

As already mentioned, some of this criticism was stated years ago. Nowadays mass production has brought prices down and headsets are more affordable.

Prospectively, according to Lege and Bonner (2018) and Elmqaddem (2019,) even cheaper hardware will become available. Today VR is more affordable and efficient. Elmqaddem (2019) quotes Michael Abrash, head of the scientific team at Oculus VR: '[W]hat VR allows us to do today was technically almost impossible a few years ago' (p. 236). According to Abrash, VR has evolved and is now mature enough to be integrated in educational contexts.

As to simulation sickness, the latest VR tools also seem to cause side effects.

Nevertheless, Klampfer (2017) refers to individual and technical factors which may

increase occurrences of the illness. These are presented in Table 1 and Table 2 below.

Table 1. Individual Factors

Factor	Comment
Age	Greatest susceptibility between 2 and 12 years. Susceptibility decreases successively until the age of 50, then it disappears
Experience with simulators	Experience with VR lowers susceptibility
Gender	Women more susceptible to simulator sickness
Ability for mental rotating	Enhanced ability to mental rotation decreases incidence

Source: (Mehlitz, 2004, p. 12)

Table 2. Technical Factors

Factor	Comment
Binocular vision	Stereoscopy increases susceptibility
Field of view (FOV)	Greater FOV increases susceptibility
Use of tracking systems	Geometric distortion and other sources of error may lead to greater susceptibility
Display refresh rate, interaction interval	Every delay in the display, due to either slow refresh rate or long interaction intervals may lead to greater susceptibility
Speed	Higher speed during navigation causes simulator illness

Source: Mehlitz 2004, p. 13

According to Klampfer these factors and the type of VR application must be considered from a methodical/didactical point of view before using VR for educational purposes. Further guidelines and recommendations on the practical implementation of VR is provided in the next chapter.

2.2 Recommendations for Setting up a VR Training Course

As already stated VR has the potential to transform the way we learn and teach, from providing in-depth knowledge and helping us understand complex subjects to facilitating language immersion and virtual trips. While the potential benefits of using VR in educational settings are still being established, the previously mentioned aspects of VR experiences are also likely to enhance adult learning as part of well-

designed learning activities. However, by providing a safe, accessible and affordable environment for learners to 'learn through experience', VR may not only enhance future adult education in general (Beqiri, 2017), but can also provide a very effective way of educating low-skilled and low-qualified adults. It can offer them an interactive experience in which they can learn, irrespective of their literacy and numeracy skills. In this context, VR technology offers a new tool for educators in modern day education and provides a new way of reaching out and engaging learners (Bell and Fogler, 2004).

To take advantage of VR's potential in education, setting up a VR training course requires methodical and didactical planning and the consideration of various aspects in advance. In the following sections some key questions concerning the preparation and implementation of VR in education are addressed. The next section provides some support for considering the needs of low-skilled and low-qualified learners, and it aims to help all adult educators to integrate VR successfully into their educational environment.

2.2.1 Training low-skilled and low-qualified adults and VR – general aspects to keep in mind

Adult educators thinking of setting up a VR training course for low-skilled and low-qualified adults must take many different factors into account.

Firstly, they must consider that adult learners differ in many ways from younger students and children; have different motivational drivers; have pre-existing experiences with learning processes that can be both positive and negative; and often have been absent from education or training for prolonged periods of time, and as a result it is often more difficult to motivate this target group. Therefore, like any educational activities, using VR in adult education requires careful planning and adaptation ensuring that the technical and contextual aspects of the learning meet the current expectations and needs of these adult learners.

Secondly, educators working with low-skilled and low-qualified adults (refugees, migrants, school drop-outs, people who have been long-term unemployed) have to strive for 'multiformity' as already mentioned. There is a life story behind each adult learner, as well as a world of educational experience. Therefore, for educators working with low-skilled and low-qualified adults, it is crucial that they know and

understand their audience. Knowledge of the different adult learning theories will help educators plan their VR-infused lessons from conception to development and execution in a way that facilitates an effective learning process (Popescu, 2019).

Thirdly, if using VR applications in education with low-skilled and low-qualified adults it is necessary to consider carefully the level of their existing knowledge, their motivation and learning styles and how they will be able to put their gained knowledge into practice effectively.

In order to ensure the motivation and involvement of low-skilled and low-qualified adult learners in the learning process, it is crucial to use VR content at a level that is compatible with the computer literacy and initial ICT (Information and Communications Technology) skills and associated confidence of the learners.

Before adopting and implementing a new technology like VR into a learning environment, the *AR & VR Whitepaper: Implementing VR in the Classroom* (ClassVR, 2017) has highlighted a number of key questions which should be taken into account. Some of these are presented in the following sections.

2.2.2 Setting up a VR training course – key questions to consider

To ensure that learners, and low-skilled and low-qualified learners in particular, ultimately benefit from VR and its implementation, careful planning and understanding of the innovative technology are required. To support this process the *AR & VR Whitepaper* (ClassVR, 2017) suggests the following key questions, which we will consider in our sections below.

- How do we find the right equipment?
- How will we install and manage it?
- How do we integrate it into our lessons and curriculum?
- How can we measure the success and outcomes from using it?
- What training is required for our teachers to use it effectively?
- What ongoing support and training is available?

2.2.2.1 Consideration of VR hardware and installation

Prior to developing a VR activity for the classroom decisions about the right equipment and its installation have to be made. As with any technology purchase, it is important to understand what options are available on the market and their capabilities, strengths, limitations and costs. This knowledge and understanding will help guide adult educators towards the most effective solution (ClassVR, 2017). In this context the Viral Skills project published the [VR Digest](#), which includes not only the main commercially available VR systems today but also a SWOT (Strength, Weakness, Opportunity & Threats) analysis of their educational use. A summary of the VR Digest can be also found in the Technical Introduction of this compendium.

There are currently three common categories for VR/360-degree hardware devices:

- Dedicated PC headsets
- Smartphone-based VR
- Stand-alone VR

Understanding how these will connect to your existing network, what ICT requirements they have, how much internet connectivity they need or how much bandwidth they use are also important factors to consider.

Further, in terms of setting up and managing the VR system in the classroom, consideration needs to be given to the fact that most VR systems have been designed for individual use rather than in a shared or group environment. Obviously, this poses several challenges for educators not only in terms of health and safety but also in terms of class management. Consideration also needs to be given to the capital investment required for classroom-based systems, i.e. having to purchase individual headsets and possibly PCs for each learner. Moreover, questions should be raised in terms of trainer-based controls with the ability to pause devices, and view and monitor learners' content, as well as the possibilities to capture data and feedback in terms of measuring learning outcomes and conducting assessments. Understanding what classroom controls a system has, and how they are used in practice, needs to be considered so that a lesson can be successfully delivered (ClassVR, 2017).

2.2.2.2 *Didactical and methodical questions and steps*

Once the right VR hardware is found and installed, didactical and methodical questions in terms of using VR in one's educational setting have to be raised. In this context several aspects must be taken into account, beginning from the identification or design of the right VR content over its integration in the course schedule to forms and strategies in order to support and measure the learning process. The sections below provide some support and guidance in this regard. To set up a VR training course in adult education, and in particular for low-skilled and low-qualified learners, the following steps should be considered:

- Firstly, **design or identify the VR activity** that aligns with the course objectives. Identify VR applications that relate to course content in a meaningful, authentic way for your adult learners.

Aware of the possibilities that VR offers, the first thing to do is focus on the educational objective and information you think may be interesting and relevant to investigate in this context. This exercise can be carried out by the trainer or through a collective and participatory activity conducted in class with learners (Gabbari, Gagliardi, Gaetano & Sacchi, 2017). Particularly in terms of low-skilled and low-qualified learners, it is important to select resources and VR content that contribute to reaching a tangible real-world learning outcome for the adult learner.

Ideally, learning resources with VR components should be mapped to the curriculum of one's course, ensuring that the material is at a suitable level for the learner, and that mastery of concept is at least obtainable. This is crucial when using VR for low-skilled and low-qualified adult learners. It is very demotivating to be confronted with materials that are too difficult and which contain vocabulary beyond a learner's current level. Learners will lose interest in the material. Likewise, it is also demoralising to be presented with redundant, previously learned information which renders the whole exercise meaningless. It is a complex balance, but one that needs to be attended to, securing a proper relationship between learner and study materials (Veative Labs, 2019).

In this context, one option might be to design the learning material on one's own. What is presented in each resource would need to be designed slightly differently, attending to a different way of relating that particular concept to the world around

us. A cookie-cutter approach would not suffice, as learning about atomic numbers and the Periodic Table would be inherently different from studying relative motion. Further, some amount of gamification would increase interest in some cases, e.g. when it comes to school drop-outs having difficulty with traditional ways of learning. But not everyone and every content benefit from a gamified approach. Despite all that, VR has demonstrated that it can most definitely help with visualisation, increasing the connection between learner and concept (Veative Labs, 2019). Building educational resources from 360-degree images and videos can provide an entire cross-curricular resource bank to drive engagement across all subject areas. As demonstrated in chapter 2.1.5 another possibility is to allow learners to build VEs and learning content on their own. In this context, VR provides the learner with opportunities for autonomous learning. As shown by Winn and Hoffman (1997), those who did not learn well in conventional, symbol-orientated pedagogy may particularly benefit from building VEs.

Research conducted by Mihalíková and Líška (2006) identified three basic levels of VR immersion:

- **Passive:** this type of VR experience is implemented through a presentation of the resource as a 'movie'. It lets the learners experience (see, hear and sense) the content, but they cannot influence the process nor modify the elements of the VR environment.
- **Active:** these types of applications allow the learners to move freely in the environment, explore it and sense virtual sounds. They are involved in the happenings and engaged with their environment, but they are not able to move objects or modify the environment.
- **Interactive:** this is the most sophisticated level, where the learners can engage with the VR environment and also modify it. They can move objects, assemble etc. The learners can record the process, revise it and assess their learning.

When developing a training course and resources, as well as considering the above aspects, educators should choose the appropriate level of VR in keeping with the course's learning outcomes.

- Secondly, **consider the placement** of the VR activity **within the course schedule**.

When thinking of integrating VR in one's educational setting, there are a number of ways in which VR can help fill gaps in the learning process or complement it. VR, for example, can provide a valuable opportunity to visualise a conceptually challenging idea, increasing the possibility of more deeply understanding concepts which may not be clearly understood otherwise. In this context, it is important to see and use VR as a tool to enhance and contribute to one's curricula resources, rather than replacing them. For this reason, a VR experience might, for example, either precede or follow discussions of the learning material during a typical class session, depending on the instructional goals.

- Thirdly, **make plans to measure student learning**, aligning assessment objectives with learning goals and activities.

There are a number of options to evaluate and measure learning processes initiated by the use of VR. These may include a pre-assessment prior to the VR experience and a post-assessment afterwards, the use of traditional quizzes and/or tests, in addition to student reflections on their VR learning experiences. Depending on the VR application chosen, a learner might also obtain tutor feedback in real time while participating in the VR experience.

- Finally, **allocate time and resources for learners to learn how to use VR** – both the hardware and software applications. Emphasise that the VR technology is a tool to support their learning.

Typically, in most VR learning environments the learner is the driver behind the learning. Learners move through the resources at a pace that is appropriate or their own learning styles and needs. Learners naturally find areas for which they need extra time, and instances when they are sure of the subject matter and can move through it quickly. Unlike with a video or a teacher-centred lesson, the control is in the hands of each learner, allowing them to control the pace. This in turn increases motivation as they are the agents of their learning.

Nevertheless, like with any new technology it is important to understand first the learner's attitude towards VR. This means considering not only their individual

perception of the technology, but also their willingness to incorporate it in their learning (Huang, Liaw, & Lai, 2013). Low-skilled and low-qualified adult learners in particular may have fears and reservations about using ICT, specifically VR hardware and software. For this reason, it is crucial for adult educators to support these learners to overcome their fears, to convince them of their ability to use these technologies and to teach them how to control and exploit them.

It is also important that prior to the start of the activity educators clearly articulate the goals of the virtual reality activity to learners and relate it to how it will help them achieve their learning outcomes

2.2.2.3 Training and support for adult educators

As with all educational technology, the correct provision of educational support resources, including training, development, and technical and teacher support, is a critical component to ensuring positive adoption, and the path to a successful implementation of VR in education. Implementing any new technology in the classroom means educators and learners need help and support to familiarise themselves with it, and to understand how best to use it during lessons. For this reason, the Viral Skills partnership provides this *Viral Skills Compendium and E-Thek* and has developed a VR course called 'Viral Skills Training Programme'. These offer adult educators and those working with low-skilled and low-qualified adults the opportunity to become familiar with VR, its implementation and existing VR applications.

Educators should continuously update themselves by engaging with interesting research, articles, books, videos, blogs and magazines dedicated to VR. Some further reading in this context is listed below.

Further Reading

- ▶ [A Framework for Desktop Virtual Reality Application for Education \(2016\)](#)
- ▶ [VR Learn: Virtual Reality & Learning \(2017\)](#)
- ▶ [Cloud AR/VR Whitepaper \(2019\)](#)
- ▶ [A guide to VR & AR in education \(2019\)](#)
- ▶ [OpenXR: Virtual Reality wird einfacher \(2019\)](#)

3 Country Comparison

The global VR market is now dynamic and competitive. Today, VR technology can be used for low-skilled and low-qualified people as it offers several benefits, engaging them more comprehensively in the learning experience than ever before. The aim of this chapter is to give a brief insight into developments in VR learning in Europe and elsewhere (such as China, Japan and the USA). The following is a summary of the global developments, trends and standards in VR learning and a comparison of the state of the art within the European Union (EU), focusing on low-skilled and low-qualified learners.

3.1 The state of the art in VR learning within Europe

Europe's VR ecosystem continues to grow, with more and more companies entering the sector. According to the Centre for the Promotion of Imports from developing countries (CBI) there are 530 VR-related organisations in Europe, and many of them already use VR as part of their training. Indeed, the EU supports VR creation, and technological development is the key element of the EU Commission's Next Generation Internet initiative. Based on the latest report of CBI (2019), Europe is responsible for a fifth of global VR market and thus is one of the major players along with Asia and North America. In this context the European VR frontrunners are France, the UK, Germany, the Netherlands, Sweden, Spain and Switzerland. However, in recent years, important VR initiatives have also emerged in Finland, Denmark, Estonia, Italy, Poland and Greece (Bezegová, Ledgard, Molemaker, Oberč & Vigkos, 2017).

Europe has a rich tradition in academic VR research and VR development. European companies, hubs and research institutes benefit from research funding from both national and EU sources. Many European innovative start-ups, companies and universities are developing VR technologies and software that enable the use of VR in different application areas.

Focusing on learning, VR glasses for example are used in educational institutions in many European countries. With this technology, learners can visit places, monuments and festivals, bringing knowledge even closer to students otherwise unable to access it (e.g. due to disability). Furthermore, special VR applications have been created exclusively for use in formal and informal educational settings. School and universities

have been experimenting with adding VR as a teaching tool or making VR lectures a part of the curriculum (Bezegová, Ledgard, Molemaker, Oberč & Vigkos, 2017). Some companies such as 'Labster' in Denmark (which created virtual labs for experiments), Immersive Education in Ireland and Lifeliqe in the Czech Republic are working in VR education by providing new VR solutions for learning and exploring. Museums and galleries are also using education with VR. For example, Virtual Dutch Men in the Netherlands is very interesting as it has created a fictional virtual museum gathering masterpieces from different museums and exhibitions. Other galleries, such as Serpentine Galleries in the UK, are also collecting pieces in VR. One great VR initiative within the EU is the [EuroVR Association](#), a non-profit association which provides a network for all those interested in VR. The association aims to gather together individuals, national chapters and associations, large companies, research institutions, universities and laboratories with a keen interest in VR.

3.2 VR learning and development in Asia (Japan and China)

In recent years the Asian VR market has been growing at a high rate, driven by the support of local governments, and is becoming very competitive globally. In terms of VR topics, Asia is active in content creation; however, for cultural and language reasons, it is mainly focused on the Asian market.

The Japanese VR market has a lot of strong players in the gaming field and VR has largely been used for entertainment purposes. Outside gaming, there are also some initiatives in education according to [EU-Japan Centre for Industrial Cooperation](#). VR initiatives in Japan are applied in a wide variety of industries, such as medicine, tourism, retail and manufacturing. Specifically, VR companies in Japan are working on developing VR technologies for industrial solutions and creating opportunities to commercialise those technologies.

The Chinese VR ecosystem is evolving fast and China is very active in the field of VR development, enjoying strong growth. In the next five years, China could dominate the VR market (Merel, 2018). Many of its start-ups are working on software development in the area of education and workplace. The Chinese government has committed to facilitating VR growth within the country, emphasising innovation and considering VR a key technology for the development of the country (Dayan, 2017). China's interest in VR focuses on some key areas:

- **Education:** to make learning more efficient and entertaining. Schools in China already use virtual classes and virtual examinations.
- **Culture:** to promote tourism and to preserve important historical places and monuments virtually forever.
- **Health:** VR is used in training doctors and treating people.
- **Business:** VR is used in real estate, interior decoration and apparel virtual design.

China invested in the integration of VR in education and thus the VR education market is growing fast. A recent report by Huawei shows how the transformative technology of VR is having an impact by improving education and training, and the role that operators can play in further improving the uptake of technology for the benefit of students and trainees (Huawei Technologies LTD Report, 2018).

One example of VR education in China is VR SCHOOL, which focuses on vocational education. VR SCHOOL provides a complete VR teaching solution to schools through its range of education software, allowing teachers to begin using VR immediately. The software includes a VR content production engine and class management system, and offers other essential services, such as class development and teacher training (Alhadeff, 2018). Another example in the educational area is FLY VR, which provides hardware, software and content for the school market. It focuses on science and vocational education, but also offers solutions on other aspects of school life such as fire and earthquake drill practice.

Another example is the company NetDragon Websoft, which focuses on VR professional education and developer training, and uses VR to improve regular classes. NetDragon supports VR start-ups and the creation of VR labs in higher education. It also develops some VR education content (e.g. human anatomy), particularly for vocational schools.

The initiative Donghu VR Town is designed with VR intertwined in every aspect, from services, healthcare, education to entertainment. In terms of VR hardware, Doldo has developed cutting-edge VR glasses for a better and more comfortable user experience. Other examples in the VR ecosystem include the Langzou VR in education, VR Waibao in collaboration tools and 7invensun for eye-tracking addons

(Alhadeff, 2018). All the above examples can be used for learning purposes for low-skilled or low-qualified people.

3.3 VR in the USA

The USA has a leading position in the global VR market. VR software development is the main activity of several VR companies situated in the USA. A recent report by a higher education technology company shows that almost half of US colleges use VR technologies. Higher education institutions are investigating a range of uses for VR technology, from offering virtual lab facilities for remote students, to simulated surgical procedures to train medical students. The US VR market is forecast to grow, with lower-cost alternatives and portable devices becoming more widely used, such as Google Cardboard and Oculus Go (Hills-Duty, 2018).

To understand the usage of VR in education within the USA, we provide the following examples: NC State University is using VR in Introductory Biology as a way to immerse learners in field-based experiences. St John's School Boston in Massachusetts is using Minecraft and VR to create immersive experiences. Penn State University in Pennsylvania is training students to do things in the virtual world as a precursor to doing it in reality, increasing the efficacy of learning. Drury University in Missouri is teaching architecture design using VR tools. Stanford University's students are using Viar360 to create virtual tours of museums. Some other educational institutions have been using Oculus Rift to help students with special needs and to do therapeutic exercises with autistic students. The University of Michigan is using VR to let potential football-playing students experience being on the field in a full stadium.

Besides using VR for teaching or learning, a number of academics are studying the impact VR will have on society as a whole. Outside higher education, some media publishers, including The New York Times, have jumped into VR storytelling (Hills-Duty, 2018).

3.4 VR examples and low-skilled learners

Considering the above trends and standards, the following are examples of VR in education which can be used for low-skilled and low-qualified people, including drop-outs, refugees and students with intellectual deficits:

- **Google Translate VR** provides the opportunity to translate 30 languages using the camera to watch the translation in real time. This feature is great for language students and students speaking other languages.
- **Titans of Space** offers a tour of the solar system with voiceovers and music, and was ranked a cutting-edge product to learn science. It can ideally be used for students with intellectual deficits and little interest in learning science.
- **Flashcards** helps students learn words in a colourful and fun environment. It transports students into a fascinating electronic world where learning is a side effect of the experience. Studying flashcards in VR lets students see written words and images, as well as hearing them read aloud, aiding both the visual and auditory learner in multiple languages. Hearing foreign words as well as seeing them is a huge boon for foreign language students.
- **Imag-n-o-tron** makes stories jump off the page and come to life. This new storybook app supports learners of any age to improve their reading. It provides the opportunity to download content while engaging with complementary images, making the VR world an educational space.

Regarding the low-skilled and low-qualified learners and individuals with learning challenges, VR provides an alternative medium to meet their needs and facilitate their learning experiences. Indeed, educators believe that with VR education programmes those learners can increase their engagement and improve their overall performance. Also, hands-on learning techniques like VR education directly contribute to increased cognitive abilities such as memory, attention, and concentration (Chandrashekar, 2018) by bringing learning to life via a virtual environment. The more a learner is able to participate in lifelike engagement, the easier it is to personally feel a connection to the subject material, making it easier for application and retention of the subject matter. Examples being used in education for low-qualified learners:

- **Public Speaking VR** app helps learners to practise the skills of public speaking. The app provides photorealistic environments, and students can prepare for a job interview or a class presentation.
- **Nearpod** provides a wide variety of immersive VR experiences, including cultural visits, field trips throughout the world and even social studies plans.
- **Alchemy VR** offers 3D lectures, overlaying an immersive scene giving users an entire trip into the subject matter.

4 Target Group Survey Results

4.1 Introduction and background

The design, implementation and results presentation of the current target group survey are introduced in the framework of this Viral Skills Compendium.

For the outcomes and results of the Viral Skills project to achieve maximum impact, as regards their successful dissemination and exploitation, it is crucially important to ensure that the results are relevant for the target group (adult education managers, educators and trainers). For this reason the project work programme foresees the inclusion and consideration of the potential, wishes, knowledge base, fears and challenges of the target group itself. This was implemented in the course of a target group survey, planned and are conducted by all project partners in the partner countries of the Viral Skills project (Austria, Cyprus, Germany, Ireland, Italy and Spain). In these countries a minimum of five representatives of the target group were questioned concerning their:

- basic awareness of VR learning possibilities
- attitudes towards this issue
- fears, expectations, needs and demands when considering applying VR learning as an integrated part of their training offers, especially to low-skilled and low-qualified learners with a focus on basic education.

Based on the selected and agreed methodological considerations, all partners were asked to conduct the target group survey during May and June 2019. The following pages present the key findings and outcomes of the survey, as well as recommendations or developing the training programme curriculum. A more detailed English language version, including all results of this survey, can be downloaded from the project website www.viralskills.eu/en/downloads.

4.2 Methodology

Under the information and methodological approach provided in the work programme of the project application, the target group survey is built on two pillars:

- Conduction of a questionnaire-based quantitative survey
- Conduction of qualitative interviews with target group representatives

The methodological plan aimed for a minimum of five representatives from the target group in each country. The target group members were provided with a short questionnaire of mostly closed questions offering a choice of set responses. The target group members were then asked about their opinions and ideas on the basis of an open interview questionnaire/guideline. Under the interview guidelines, core questions were raised and discussed in the qualitative interviews, and then a number of support questions were provided in case the interviewers needed an additional prompt to lead the interview in a certain direction.

The setup of the survey was a minimum of 5 interviews per partner country resulting in a data basis of 30 interviews with adult education trainers, educators or managers. The main aim was to get an insight into the needs and requirements of the target group and to use this information to maximise the target group relevance of the results and outcomes of the project, even though the data base is rather small.

Based on this, certain relevant deductions for the further development of the outputs of the Viral Skills project and especially the training programme curriculum were made. We have chosen the circle diagram format to present the quantitative data, as it allows a graphical overview of different answers and their statistical dimension/relevance. We have chosen the word cloud format to present the qualitative data. The word cloud will allow us to visualise the importance of single words used for each question and be the basis for the results interpretation and deduction of recommendations for the further project outcomes. Each visual representation of the results was also described verbally in the full version of the target group survey; in this summary, only a few key words are provided.

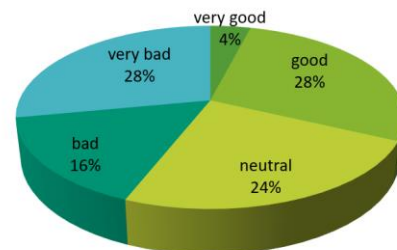
4.3 Quantitative survey results (selected examples)

How do you rate your personal VR experience in an educational context?

The personal VR experience in an educational context appears to be diverse and critical. Only 32% of the survey participants answered this question with very positive or positive, about a quarter of the interviewees gave a neutral answer and 44% gave a negative or very negative answer.

From this we could assume that participants rarely used VR technology for educational purposes at all and thus answered this question negatively. However, within our target group a large number of people have already had negative experiences with VR technology in learning and who should be treated carefully.

How do you rate your personal VR experience in an educational context?

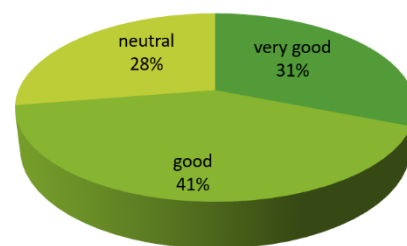


To what extent are you interested in using VR in an educational context?

This question provides more information about why some interviewees gave negative answers in the previous question, because it seems as though they simply have not had any personal VR experiences in an educational context. Overall we can expect a large majority of adult trainers, educators or managers willing to actively use VR

technology in an educational context, which forms a promising basis for the dissemination and exploitation of the project results within the Viral Skills project.

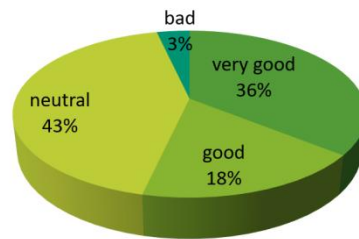
To which extent are you interested to use VR in an educational context?



To which extent is your organisation interested in using VR in an educational context?

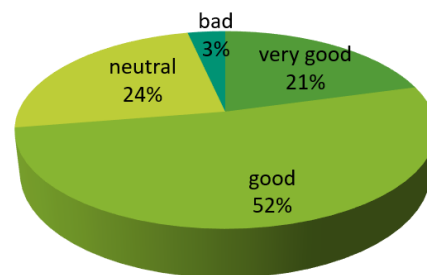
Some 54% of organisations are very much or at least willing to use VR technology in future for educational purposes, while 43% have not decided and another 3% are not interested in using VR technology in the future. A possible interpretation of this is that VR technology equipment, its purchasing costs and its maintenance effort require financial investment from the education institutions, which they naturally fear and would probably lead to a more critical result for this question.

To which extent is your organisation interested to use VR in an educational context?



About three-quarters of the respondents state that VR is a very suitable or suitable instrument for the training of adults in general. This is of course very positive feedback to receive from our target group and it also supports the assumptions and theoretical background stated in the project application of the Viral Skills project. Only 3% of respondents mention that VR would not be a suitable instrument. Overall we can build on this promising basis: that with VR technology we have an innovative and suitable instrument for adult learning, which is not only the view of the project partnership but also the majority of the project target group, the adult educators, trainers and managers.

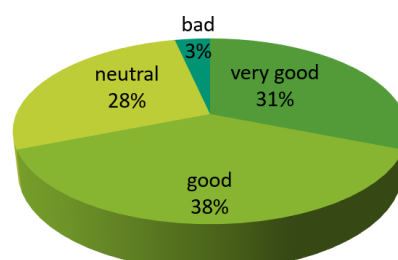
To which extent is VR a suitable instrument for training adults?



To which extent is VR a suitable instrument for training low-skilled/qualified adults?

Again, nearly three-quarters of the respondents find the potential very good or good and only 3% view the suitability of VR technologies critically ('bad'). These answers also support the assumptions in the project application and form a fruitful basis for the introduction of the Viral Skills project outputs within the target group. Also from this, it would

To which extent is VR a suitable instrument for training low-skilled/qualified adults?

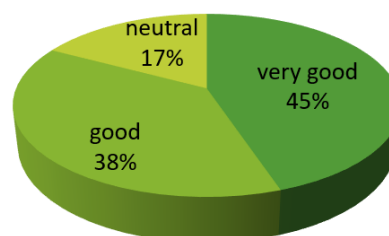


be important to specifically highlight the possibilities and advantages of VR technologies for the learning of low-skilled and low-qualified adults, as already outlined.

How helpful would you consider an online handbook for adult educators on how to integrate VR in adult learning settings?

It is unsurprising and very positive that a vast majority (83%) of target group representatives consider a handbook about the integration of VR in adult learning settings a very good or good tool. None of the participants gave a negative response towards this core project output. It can therefore be assumed that this core output of the Viral Skills project will fall on fruitful and promising ground within the target group. It is hoped that adult educators, trainers and managers will use this output and that the project and its outputs will meet current needs in adult education.

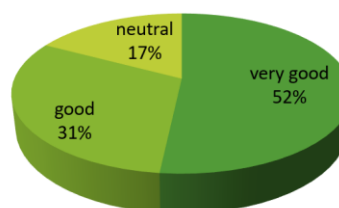
How helpful would you consider an online handbook for adult educators on how to integrate VR in adult learning settings?



How helpful would you consider an online database of VR systems, technical/structural requirements and how to set up a VR studio?

Compared to the previous questions slightly more participants gave 'very' positive answers to this one concerning the planned online database of VR systems. Again 83% of respondents considered this output very helpful or helpful for their future work. Also with this output the project can expect considerable use and dissemination impact within the core target group.

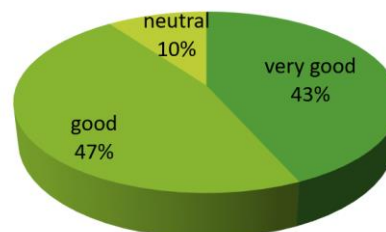
How helpful would you consider an online database of VR systems, technical/structural requirements, and how to set up a VR studio?



How helpful would you consider an online collection of VR software reviews suited for the needs of adult learners?

The vast majority of participants (90%) gave a very positive or positive answer, indicating that the selection of outputs within the Viral Skills project has been excellent, and we could see a high level of innovation and development within the target group. The partnership needs to make sure that the selected software applications are described and presented in a clear, easy to read and easy to understand manner, using a suitable design to guide adult educators, trainers and managers who wish to use individual software solutions for their adult training processes.

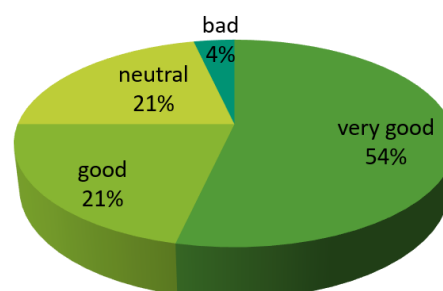
How helpful would you consider an online collection of VR software reviews suited for the needs of adult learners



How helpful would you consider a blended training course regarding virtual reality for adult education with a duration of five days classroom, five days online featuring webinars?

Exactly 75% of all respondents responded favourable towards the third intellectual output of the Viral Skills project, a training course in VR for adult education. This is very positive and will help to increase participation in the training course in the long run. However, we have to consider that 21% of respondents have a neutral and 4% a slightly negative opinion towards this output.

How helpful would you consider a blended training course regarding Virtual Reality for adult education?



Deductions from feedback received should be made thoroughly and immediately. Most importantly, the partnership should take this into account for their further developments.

4.5 Summary, deductions and recommendations

As mentioned, the outputs of this project must be specifically tailored to the target group to ensure the success and sustainable use of those outputs. This need for tailoring was the main reason behind the target group survey. Therefore, it is important to extract some core deductions and recommendations for the development of the outputs, specifically the handbook including the database of VR technology and software applications (IO2), and the Viral Skills training programme (IO3). Based on the data from the quantitative and qualitative survey, we make the following deductions consideration:

- **Key groups with target group**

When trying to introduce VR technology in adult education and specifically for the target group of low-skilled and low-qualified adults, we have to be aware that we are entering a new and **highly innovative area**. Because of this, it will be important to keep the theory of innovation uptake in mind, which is divided into different steps. It will be important to **identify the innovators, early innovators, early adopters and early majority within the target group** (Rogers, 2003). When selecting and inviting participants for the pilot tests of the training programme in the partner countries, it will be important to **focus on these three groups** to foster the **quick and solid adoption** of VR technology in adult education.

- **Positive attitude**

Overall, we have seen a generally **very positive attitude towards this innovative technology** from the target group. There seems to be a certain **curiosity** within the target group and this should be utilised when developing, testing and mainstreaming the project outputs. A large majority of the respondents stated that they would be interested in VR technology, would like to get more information and training on the subject, and would also see the high potential of VR technology in adult education.

- **Finance matters**

In many answers to various questions we see some strong concerns about the financial impact of introducing and using VR technology in adult education. In general, adult education in Europe is not in a strong financial position and respondents largely express that there may not be enough financial resources

available. This has two consequences. Firstly, when considering and listing relevant VR hardware and software, the partnership should select examples which are **affordable to a larger group of people and institutions**. Secondly, the financial costs should be as **open and transparent** as possible. For all systems listed the **approximate costs** should be stated. For the software, the preference should be for open source or free software as far as possible. The project (specifically in the handbook and/or database) could also include some information on funding options for technology investment. Learning technology and digitalisation in learning is a major political trend in most European countries, which may lead to some co-funding for technology investments.

- **Digital and technology competences**

The survey has clearly shown that there are some serious **concerns about the digital and technology competences of adult trainers and educators**. This is more significant than the **challenges on pedagogical/didactical level**. The training course should cover an extensive technology training, digital competence development and issues such as maintenance of VR systems and troubleshooting in case of problems.

- **Potential of VR hardware and software**

The handbook and all databases should clearly highlight the potential of VR hardware and software for the training and development of adult learners and specifically low-skilled and low-qualified adults.

- **Training programme**

In the survey we discovered that the target group has some concerns about the training programme **being too long and too theoretical**, e.g. the course lasting for five consecutive days. The partnership should design and develop the curriculum carefully, taking all these concerns into consideration.

- **Face-to-face training**

Despite the fact that the training programme in the Viral Skills project has a strong distance-learning dimension, the content of the whole VR embedding in adult education should **focus on the use of VR in face-to-face training sessions in adult education**. Several trainers mention that they would like to use VR technology in their programmes; however, in the course of face-to-

face training settings this should be considered in the curriculum as good as possible.

- **Fears**

In the qualitative survey, as regards working with VR in adult education the participants mention a number of fears on a personal and health level, and also fears relating to the learners and their social learning dimension. These fears need to be considered when developing the training programme, and should (especially for the health-related concerns) become part of the training content itself. Trainers need to be **aware of any health-related challenges or problems when using VR** in their classes of adult learners.

- **Success factors**

In the qualitative survey, the participants state a large number of important **success factors** for the core outputs of the Viral Skills project. These should be carefully considered so that the outputs are as relevant as possible for the target group. However, given the financial and time limits of the Viral Skills project, it will not be possible to consider all of them fully (e.g. producing videos for the explanations in the handbook). For this reason, we recommend categorising the received success factors into three categories: crucial / desirable / follow-up. The minimum objective should be to achieve and implement the 'crucial' success factors. Another objective would be to achieve some of the 'desirable' success factors.

Finally, we want to thank all the project partners and especially the adult trainers and educators who participated in this survey for their efforts and valuable contributions. We are looking forward to welcoming interested target group members to the pilot testing and external evaluation of the training programme in the course of the Viral Skills project.

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ANNEX: Viral Skills E-Thek

Software Introduction

Virtual reality (VR) is already a reality in different spheres of society, including education. Although it is still an emerging technology in relation to its potential, it is already offering opportunities that were previously unthinkable. VR allows learners of all ages to experience learning in immersive settings and to break down geographical and temporal barriers, similar to when reading a novel.

In the following chapter the Viral Skills partnership provides adult trainers with the Viral Skills E-Thek, a collection of more than 24 selected free VR software applications for educational uses. These VR learning programmes have been tested and analysed, and are recommended by the partnership for adult learning settings in general and specifically for activities with low-skilled and low-qualified learners.

Before providing trainers with more details about the E-Thek: What are the possibilities of VR in the education sector? The following section offers insight into some of its most outstanding uses and presents some VR software examples adult trainers will find in the collection provided.

Travelling without leaving the classroom

Thanks to VR, class trips do not have to be limited to the local museum or the nearby town: learners can visit and study about the Taj Mahal, for example, without moving from their classroom. This enriches teaching and makes it more fun while overcoming economic and geographical barriers.

One example analysed in the Viral Skills E-Thek is:

- **Google Earth VR:** This VR app lets learners explore the world from totally new perspectives in VR. It allows users to stroll the streets of Tokyo, soar over the Grand Canyon or walk around the Eiffel Tower. The app lets learners see the world's cities, landmarks and natural wonders.

Time travelling

The barriers VR breaks are not only geographical, but temporal. Adult learners will be able to witness the taking of the Bastille, for example, and learn history in a much more memorable way.

In this context, in the Viral Skills E-Thek trainers can find:

- **Google Expeditions:** Expeditions to real places in the world, historic events, space or the body.
- **Wonders of the World:** Learners can visit a small number of the ancient wonders including the Colossus of Rhodes, the Taj Mahal and Machu Picchu. At each site they can learn about its history and historical significance to the local area and the world through an immersive and interactive experience.

Limitless exploration

Taking learners to the moon is not a feasible option for any educational institution in the world. And it would not be the safest trip either! Through VR, adult learners can travel through space and immerse themselves in the depths of the sea to satisfy their curiosity.

The following VR apps described in the Viral Skills E-Thek might foster learning in this context:

- **BBC Home – A VR Spacewalk:** Inspired by NASA training programs, Spacewalk enables learners to embark on a spacewalk 250 miles above the Earth's surface, to date something only 227 people have ever done for real.
- **Titans of Space:** This app provides a densely educational guided tour of our solar system. Multiple versions are available for mobile and PC platforms, for VR and otherwise.
- **International Space – Station Tour VR:** Moving between 8 modules adult learners can uncover over 40 key areas of the space station that serve as the living quarters and science laboratory for an international crew of astronauts and cosmonauts.

The human body

Can anyone think of a better way to study the human body than to visit it from the inside? Imagine the experience of freely moving through the digestive system, identifying organs and discovering how they work through immersive learning. All this is possible with VR.

In the Viral Skills E-Thek adult learners can explore:

- **Anatomyou:** Using this app, the user becomes part of the anatomy in an immersive way, navigating along anatomical structures: circulatory, respiratory, digestive, urinary, lacrimal and the reproductive systems.

STEM (science, technology, engineering and mathematics)

VR can be used as an educational method for learning geometry, mathematics and sciences. In this context, described VR apps in the Viral Skills E-Thek include:

- **Times Tables VR:** This app provides a fun way for learners, especially low-skilled and low-qualified adults, to practise their multiplication skills in VR in an immersive 360-degree environment.
- **Nanome:** This app provides a free immersive nanoscale laboratory for modern VR headsets. Learners, hobbyists and drug designers use Nanome to visualise, edit and simulate their research in real time with friends and colleagues across the globe.
- **Calcflo:** Using this app adult learners can manipulate vectors with their hands, explore vector addition and cross product. They can see and feel a double integral of a sinusoidal graph in 3D, a Möbius strip and its normal or spherical coordinates. The app also allows users to create their own parameterised functions and vector fields.

Languages

VR offers a new way of learning languages: through a totally immersive VR, which would be fun and appealing.

In this context, in the Viral Skills E-Thek trainers can find:

- **Mondly: Learn Languages in VR:** The app allows users to experience the most advanced way to learn languages from the comfort of their own couch. It

perfectly complements Mondly's main language learning app, allowing learners to practise everything learned.

- **Virtual Vocab: Spanish in VR:** With this app learners can virtually go through a school and a house. By looking at a certain object such as a TV, chair or painting and clicking on it, users will hear its Spanish word, and can read its Spanish and English words at the same time.

Viral Skills E-Thek – The Selection Process

This section explains how the different software providers and their apps were selected and evaluated.

Initial internet research produced a longlist of VR apps. From this, approximately 25 were selected. These were then catalogued according to educational content, interactivity, video content or 360-degree scenes, or self-creating experiences in VR.

They were also analysed according to the following parameters: name of VR application; category; content; ranking and popularity; cost; VR-headset interactive; experience; create material/lessons; low-skilled and low-qualified learners.

With all this information the partnership will have a first vision of each of the applications selected. These applications will also be analysed and tested by the Viral Skills partners.

Each partner will proceed to test and interact with the hardware acquired the assigned applications and platforms. Each organisation should try and evaluate a minimum of four learning apps. Some of the apps in the original longlist were incompatible with the partners' VR hardware, so replacement apps were found on Steam VR or the stores/platforms of the different VR hardware systems (e.g. HTC VIVEPORT, Oculus Store, Google Play Store). Other interesting apps sourced separately by members of the team were also tested.

For the selection of the VR apps, several parameters must be taken into account:

- **Language:** VR learning apps should be available in English (many apps are available in different languages).
- **Cost:** The apps should be free (though some low-costs apps were also tested)

- **Target group:** The apps should be suitable for adults in general and specifically for low-skilled and low-qualified adults.

Once the apps met the selection parameters, more than 24 VR learning apps were assigned under the following thematic categories:

- Mathematics
- Chemistry
- Human body/anatomy
- Language learning
- Space
- Virtual museum
- World/sites
- History – Second World War
- Sport-, Music-, Social-Events
- Visual impairment

Further, two apps focus on 'Training', and a variety of apps provide 'Various Content' or a platform where content can be shared. All this VR learning software has been tested, analysed and evaluated as described in the following section.

Viral Skills E-Thek – The Evaluation Process

As part of the evaluation process, a template (E-Thek) was created to facilitate the collection and analysis of data. The partners used this template for each VR app, all of which are suitable for adult learners with low skills and low qualifications.

The E-Thek is designed to analyse the VR application, with its corresponding name and category.

Regardless of which partner evaluated it and when, the technical framework, key data, compatibility with the different VR hardware systems, operating system, and language of each VR app was taken into account.

The partners also considered each apps' learning content, and its post-use learning outcomes in terms of knowledge, skills and competences.

Also considered were the activities the app provides and whether they bring added value to low-skilled and low-qualified adult learners.

To aid the analysis, each app was rated on a scale of 1 to 5 for user friendliness, pedagogic orientation and standards, applicability level and gamification level. A SWOT analysis of each app is also provided to help trainers adapt the use of the app as appropriate.

Using this data the project partners were able to determine the ideal context in which to use each VR app, what instructions should be followed for teaching the app and the preparation required by the teacher using it.

Finally, a set of standards/rules are provided to improve or guide learning through each VR app.

The analysis demonstrates one of the biggest advantages of using VR technology in the education area: the opportunity to experience impossible or nearly impossible situations. It could be said that this is the main benefit this technology brings to education and why it is worth it.

Nevertheless, trainers should still take into account how and when to introduce VR into the classroom in order to obtain the best possible result. VR should not be used for the sake of using it; there might be other more suitable and equally valid resources. This is why research is important; it tests this technology to clarify in which situations it can be more didactically efficient.

Viral Skills E-Thek

VR Application Profile																							
Name of VR Application	Creator AVR																						
Category	Various Content																						
Date of processing: 10/10/2019																							
Technical Framework & Key Data	<p>Software provider: Google Commerce Ltd Software developer: EON Reality R&D Team Version of app: 7.8</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> iOS Version: 12.0 or later <input checked="" type="checkbox"/> Android Version: 7.0 and up <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> Other: Chinese</td> </tr> <tr> <td><input type="checkbox"/> German</td> <td></td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Other: Chinese	<input type="checkbox"/> German	
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Learning Content	Aeronautical engineering, medical, chemistry, engineering, food and nutrition, humanities, animal life on earth, astrophysics and astronomy, automotive engineering, biology, botany, culture and the arts, earth science, food and nutrition, general science, geography, history, human anatomy, industrial engineering, mathematics, monuments and landmarks, physics, virtual entertainment, etc.
Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • recall detailed information about various key subjects in a variety of fields from aeronautical engineering to biology to culture and arts
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • locate and identify the constitutive parts of a variety of objects like artefacts, organs, machines, etc. thematised in the app • create their own VR learning lessons and courses about a variety of learning subjects
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • demonstrate the ability to learn about a key subject using a number of different sources of information including VR- and AR-experiences, audio recordings, videos, etc.

<p>Activities provided</p>	<p>Users can choose the learning content they are interested in from a library. Depending on the learning content, there is usually a short informational audio and video on the specific content as well as exercises and quizzes. Learners can explore the content on their mobile phone, changing perspectives and illustrations with the touch function, or explore the content with AR or VR. In the VR mode learners can see the learning content in 360 degrees, changing their perspective on the content by moving their head and gaze. For some contents additional 360-degree tours are provided.</p> <p>Creator AVR offers single-user and multi-user mode and enables trainers to create and share educational experiences on the mobile device, with no programming experience needed.</p>
<p>Added value for low-skilled/low-qualified adults</p>	<p>This app is beneficial when working with low-skilled and low-qualified adult learners, especially school drop-outs, since it provides 360-degree visualisations of complex learning contents which make it easier to understand them. Furthermore it includes quizzes which allow a more playful approach. Additionally, trainers can add their own target group-orientated contents and tasks.</p>

<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <p>1 ... very poor/low; 2 ... poor/low; 3 ... OK/medium; 4 ... good/high; 5 ... very good/high</p>						
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<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> • Context of ideal application Ideal to enhance various thematic workshops and courses from engineering to chemistry to medical content and beyond. • Instructions for preparation <ul style="list-style-type: none"> - Before using the app, familiarise yourself with the learning material provided by the app. - Then either choose the learning content you want the learners to explore from the app's library or create a lesson/course on your own. - If you want to use content provided by the app, decide whether you want the learners to explore the whole lesson provided or just parts of it, e.g. the VR mode to visualise content. - Depending on your choice, make sure to embed the app adequately in your course schedule according to the course's learning objectives. - For some lessons provided by the app it might be necessary to clarify technical terms in advance. - Provide chairs (ideally revolving ones) for the learners, since the most comfortable way to explore the app (also the VR mode) might be in a seated position. <p>Creation of content:</p> <ul style="list-style-type: none"> - To create lessons and courses, you must first create a free account on the mobile app. - To start, tap on the '+Create' button in the right corner at the bottom of the mobile display and choose between creating a new lesson or a new course. Alternatively, you can tap the plus button in the section 'My Workspace'. 	<ul style="list-style-type: none"> - The creation of a new course works quite intuitively. - To create a new lesson, have a look at the following videos (Although they don't refer to the latest version of the app, they should help within the creation process: <ul style="list-style-type: none"> ▪ https://www.youtube.com/watch?v=yP2L_O6v9WQ [Start at minute 2:12] ▪ https://www.youtube.com/watch?v=aSHoY0w9ezo [Start at minute 3:09] - Before starting your class, add your learners to your created course or lesson in the section 'My Workspace'. - Irrespective of whether you use courses/lessons provided by the app or create your own, you can use a multi-user mode. In this context, make sure to invite all learners in advance by tapping on 'Collaborate' for the lesson you want your learners to explore. <ul style="list-style-type: none"> • Instructions for mentoring <ul style="list-style-type: none"> - Explain the structure and functionalities of the app in advance and give the learners time to become familiar with the app. - Since a lot of information is provided by the app it might be useful to state the specific learning outcomes which should be achieved after using the app or parts of it (the suggested learning outcomes by the app for each lesson might be helpful in this context). - If you created your own course or lesson, refer to your own formulated learning outcomes in the app.
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	<ul style="list-style-type: none">- It might be useful to summarise the most important information about the learning content after the app was used and/or discuss the users' experiences.• <i>Do's and don'ts</i><ul style="list-style-type: none">- When using the VR mode of the app only, provide learners with further information to the content in class.- The app might also be a successful tool in the context of blended learning formats.
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VR Application Profile																							
Name of VR Application	NYT VR																						
Category	Various Content																						
Date of processing: 29/10/2019																							
Technical Framework & Key Data	<p>Software provider: The New York Times Company Software developer: The New York Times Company Version of app: 3.5.9</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input checked="" type="checkbox"/> Android Version: Minimum 7.0</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td></td> </tr> <tr> <td><input type="checkbox"/> German</td> <td></td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input checked="" type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input checked="" type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish		<input type="checkbox"/> German	
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<input type="checkbox"/> Spanish																							
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Learning Content	News and documentaries																						

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • explain the backstory of conflicts, natural disasters or politics • distinguish places in foreign countries and connect them to incidents reported in the <i>New York Times</i>
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • navigate through a VR environment with the use of sight and hand motion
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • prioritise learning content through the choice of topics • understand the evolvement of opposing opinions and process behind current affairs • critically evaluate different opinions on current topics as perceived by the various documentaries • analyse future news by recognising varying/opposing actors/parties and opinions
Activities provided	Choose a video from a range of topics: documentaries, investigations, science and tech, US politics, travel, news, opinion, and arts and music. Watch a video with audio about the different topics or, specifically in the travel section, emerge into a virtual space.

<p>Added value for low-skilled/low-qualified adults</p>	<ul style="list-style-type: none"> Condensed collection of documentaries and news which help low-skilled adults to gain an overview of current affairs without having to process too much information at once Virtually travel to places which are otherwise inaccessible and emerging into the scene of war conflict or accompanying refugees on their way to safety which gives low-skilled adults the opportunity to become emotionally involved with a topic and foster interest Receive information with no necessity for high level reading skills which is otherwise typical for news outlets such as newspapers, etc. 												
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	<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> Users can get emotionally involved in the topic/scene displayed Users can find a topic which interests them Users might get captivated by a story 	<p>THREATS</p> <ul style="list-style-type: none"> Users might prefer to simply watch a video on a website Low-skilled adults might not be able to comprehend that some videos display subjective opinions It might be disturbing for some viewers to virtually emerge, for example, into a war scene
<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> Context of ideal application In a university, adult education classes or in a museum in the context of journalism, politics and current affairs. Instructions for preparation Be aware that the app contains scenes and information which some users might find disturbing, especially as the user might feel as if they are virtually in that scene, e.g. war or genocide. Instructions for mentoring Choose a topic to watch which the user feels comfortable with. Spend time after using the app to reflect on and discuss the topics watched, since there are sometimes subjective opinions among users. 	

- ***Do's and don'ts***

- Give a short introduction to the use of the app.
- Do not let learners use the app on their own without time for reflection afterwards. Low-skilled adults in particular need time for reflection and discussion after using the app.
- The app is not suitable for children.

VR Application Profile																					
Name of VR Application	YouTube VR																				
Category	Various Content																				
Date of processing:	30/10/2019																				
Technical Framework & Key Data	<p>Software provider: Google LLC Software developer: Google LLC Version of app: 1.21.50</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version: <input checked="" type="checkbox"/> Android Version: 1.21.50</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input checked="" type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	<p>Through this application, you can experience your favourite YouTube videos, channels and creators in VR. The YouTube VR app basically can turn any video into a VR experience and makes YouTube a 3D world you can explore from the inside.</p>																				

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • follow the basic steps to set up and use the app for learning purposes • list at least three possible ways they can use the app for teaching and learning
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • set up and use the app in a practical way • download and upload content of their interest to be viewed through the app • follow required steps to debug if any problems show up during use of the app • indicate and describe ideas to integrate this app in various education contexts • browse and select relevant content from different channels and videos
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • demonstrate capability to use successfully all functionalities of the app
	<p>Activities provided</p> <p>Users can select from a variety of different topics/context/channels/videos based on the learning content and they have the opportunity to further explore the content in 3D mode/VR as an introductory, evaluation or exploration activity.</p>

Added value for low-skilled/low-qualified adults	<p>This app is highly suitable for HEIs as an introductory practical example because it is easy to get started as a user. Even users with very limited skills can easily get started since most of the users are already familiar with the ordinary YouTube app.</p>									
SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <p>1 ... very poor/low; 2 ... poor/low; 3 ... OK/medium; 4 ... good/high; 5 ... very good/high</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #1a2b4d; color: white;"> <th style="text-align: center; padding: 5px;">STRENGTHS</th> <th style="text-align: center; padding: 5px;">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px; vertical-align: top;"> <ul style="list-style-type: none"> • Supports most devices • Offers spatial audio, where depth and distance play a role depending on where you look • Easy navigation: you can switch between voice and keyboard controls to browse and search with ease </td> <td style="padding: 5px; vertical-align: top;"> <ul style="list-style-type: none"> • Limited capabilities in terms of usability • Users can not interact with the material • The large size of the app to be downloaded might discourage some users from doing so </td> </tr> <tr style="background-color: #1a2b4d; color: white;"> <th style="text-align: center; padding: 5px;">OPPORTUNITIES</th> <th style="text-align: center; padding: 5px;">THREATS</th> </tr> <tr> <td style="padding: 5px; vertical-align: top;"> <ul style="list-style-type: none"> • Supports 360-degree video, enhancing the interactivity with users • Suitable for learners of all levels </td> <td style="padding: 5px; vertical-align: top;"> <ul style="list-style-type: none"> • Limited ability to sustain users' interest • Might not always give an additional value to learners </td> </tr> </tbody> </table>		STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Supports most devices • Offers spatial audio, where depth and distance play a role depending on where you look • Easy navigation: you can switch between voice and keyboard controls to browse and search with ease 	<ul style="list-style-type: none"> • Limited capabilities in terms of usability • Users can not interact with the material • The large size of the app to be downloaded might discourage some users from doing so 	OPPORTUNITIES	THREATS	<ul style="list-style-type: none"> • Supports 360-degree video, enhancing the interactivity with users • Suitable for learners of all levels 	<ul style="list-style-type: none"> • Limited ability to sustain users' interest • Might not always give an additional value to learners
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	<ul style="list-style-type: none"> • Gives users autonomy to choose material according to the chosen topic 	<ul style="list-style-type: none"> • Users might get addicted to the app since it involves watching videos
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application <p>The app can be used in almost all contexts, since it gives users the opportunity to select any domain/sector and select relevant channels/videos for exploration in VR. The app can also be used as an additional activity to gain better understanding of a topic during a learning activity.</p> <ul style="list-style-type: none"> • Instructions for preparation <p>The app can be used on most VR devices and hardware and has single/multi-user capability. It can be downloaded conveniently from the VR device search engine and requires registration through the device's account.</p> <p>Users do not have to move around while using this app; it will be easier for them to be seated.</p> <p>A microphone is useful if you want to search video content with your voice.</p> <ul style="list-style-type: none"> • Instructions for mentoring <p>Ideal app for the start of a lesson. Before using the app give learners clear learning objectives.</p> <p>After an initial discussion, encourage learners to experience the app by themselves before working on the content in pairs or groups.</p>	

The app should only be used for a limited time to prevent users losing interest.

- ***Do's and don'ts***

Don't use this app without having specific objectives to achieve, as users might lose easily their confidence and misrepresent the additional use of this app.

The following link to a collection of 360-degree videos in English and German might be useful for finding suitable content for adult education: <https://www.vhs.at/de/vrbrille>

VR Application Profile																								
Name of VR Application	ARTE360 VR																							
Category	Various Content																							
Date of processing: 27/09/2019																								
Technical Framework & Key Data	<p>Software provider: Microsoft Store Software developer: ARTE GEIE Version of app: APK 1.7.0</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: ACER OJO500</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <table border="0"> <tr> <td><input type="checkbox"/> iOS Version:.....</td> </tr> <tr> <td><input type="checkbox"/> Android Version:.....</td> </tr> <tr> <td><input checked="" type="checkbox"/> Other: Windows Version: 10 version 16299.0 or higher</td> </tr> </table> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input checked="" type="checkbox"/> Italian</td> </tr> <tr> <td><input checked="" type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: ACER OJO500	<input type="checkbox"/> Oculus Go		<input type="checkbox"/> iOS Version:.....	<input type="checkbox"/> Android Version:.....	<input checked="" type="checkbox"/> Other: Windows Version: 10 version 16299.0 or higher	<input checked="" type="checkbox"/> English	<input checked="" type="checkbox"/> Italian	<input checked="" type="checkbox"/> Spanish	<input checked="" type="checkbox"/> German
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Learning Content	ARTE360 VR is the first broadcasting platform dedicated to distributing immersive, interactive, narrative cinema experiences in 360 degree and mixed reality.																							

Learning Outcomes	Knowledge
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> list at least three possible ways they can use the app for teaching and learning
	Skills
Learning Outcomes	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> indicate and describe ideas to integrate this app in various education contexts browse and select relevant content about various topics
	Competences
Learning Outcomes	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> demonstrate capability to use successfully all functionalities of the app choose the right content to investigate a subject
	Activities provided
	ARTE360 provides immersive and interactive experiences in 360-degree video and mixed reality. It allows users to step inside a movie and see the scenes unfold all around them as if they were there.

Added value for low-skilled/low-qualified adults	With this app low-skilled and low-qualified learners will be able to explore a wide range of topics by immersing themselves in a film, being able to see the scenes unfold around them as if they were there. They might therefore understand learning content much easier than with traditional methods.								
SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <p>1 ... very poor/low; 2 ... poor/low; 3 ... OK/medium; 4 ... good/high; 5 ... very good/high</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #1a3d54; color: white;"> <th style="text-align: center;">STRENGTHS</th> <th style="text-align: center;">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Improves learning • Content is regularly updated • Stimulates critical thinking </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Dependence on the hardware platform • Is part of the specific brand • Difficulty finding qualified teaching staff </td> </tr> <tr style="background-color: #1a3d54; color: white;"> <th style="text-align: center;">OPPORTUNITIES</th> <th style="text-align: center;">THREATS</th> </tr> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Software creation for many application fields • Links between different devices • Insert elements of AR </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Potential privacy problems • Any technical problems or delays in the app development phase • Failure to reach the required level of experience </td> </tr> </tbody> </table>	STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Improves learning • Content is regularly updated • Stimulates critical thinking 	<ul style="list-style-type: none"> • Dependence on the hardware platform • Is part of the specific brand • Difficulty finding qualified teaching staff 	OPPORTUNITIES	THREATS	<ul style="list-style-type: none"> • Software creation for many application fields • Links between different devices • Insert elements of AR 	<ul style="list-style-type: none"> • Potential privacy problems • Any technical problems or delays in the app development phase • Failure to reach the required level of experience
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Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Cultural education. • Instructions for preparation <ul style="list-style-type: none"> - It is important to prepare the VR laboratory in advance. Make sure that all software updates (operating system, drivers) are installed on each PC with a connected VR viewer. The display must be optimised for VR. - The ARTE360 VR software must be installed as a system administrator and the launcher icon available on the desktop. The learner will not be able to change any system settings. • Instructions for mentoring <ul style="list-style-type: none"> - Explain how ARTE probes collective and individual memories, opening a personal gateway to contemporary history. - Intervene immediately if there are problems of a technical or learning nature. - Prepare a small guide for the learner, explaining all the steps they must perform in the activity with the viewer and ARTE360 VR software. - At the end of the activity give users a questionnaire to assess the activity performed. • Do's and don'ts <ul style="list-style-type: none"> - Due to small delays (latencies) and inaccuracies of the gyroscope, it is good to move slowly and alternate the virtual immersion activity with pauses by removing the headset.
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VR Application Profile																							
Name of VR Application	Unimersiv																						
Category	Platform - Various Content																						
Date of processing:	01/10/2019																						
Technical Framework & Key Data	<p>Software provider: Unimersiv Software developer: Unimersiv Version of app: 4.05</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:</p> <p><input checked="" type="checkbox"/> Android 5.0 (with Google VR Services) or higher</p> <p><input checked="" type="checkbox"/> Other: Windows Version: 7 or higher</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> Other: French</td> </tr> <tr> <td><input type="checkbox"/> German</td> <td></td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Other: French	<input type="checkbox"/> German	
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Learning Content	<p>Unimersiv claims to be the largest platform for VR educational experiences and applications available. The app itself provides access to a number of different learning experiences which include field trips (International Space Station, Acropolis of Athens, etc.) which enable users to learn using VR technologies.</p> <p>Currently available for free (on Oculus devices only), the learning content includes VR experiences covering the following:</p> <ul style="list-style-type: none"> • Human body/human brain • International Space Station • Historical places • Dinosaurs • <i>Titanic</i> <p>More elaborate learning content for all these topics is available through the paid version of the app. The platform provider, Unimersiv, also offers customised VR training solutions (e.g. VR forklift training); however, this is an additional paid service.</p>
Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • identify core concepts and processes of learning through a VR experience • recall the anatomy of a human body and the functions of the brain • describe conditions on the International Space Station

	<ul style="list-style-type: none"> • identify some of the most important historical civilisations and places in Europe, including the city of Ancient Rome and the Acropolis of Athens in Greece • describe 12 different types of dinosaur and how they interacted with their environment • describe both the interior and exterior of the famous <i>Titanic</i> passenger liner 	Activities provided	<p>Each app provides different activities for learners to undertake and these are tailored towards the content of each of the modules. These can be roughly summarised into the following:</p> <ul style="list-style-type: none"> • Open world exploration • Guided liner tours (interaction with menus) • Audio descriptions which learners listen to as they progress through the activity
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • complete simple steps and tasks required to use the app and complete the tasks assigned • use the VR equipment effectively in order to complete assigned tasks • control and navigate through the different environments using a number of physical movements and actions 	Added value for low-skilled/low-qualified adults	<p>This app has high potential for added value for low-skilled and low-qualified adults which include:</p> <ul style="list-style-type: none"> • Fully guided experiences with good quality learning content throughout • Wide variety of learning experiences which motivate learners to continue with experiences • VR experiences, while immersive, are suitable for beginners • The content is learning-orientated rather than focused on gaming, as such it affords learners the ability to proceed at their own pace rather than being pressured to completed set or defined tasks
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • demonstrate the ability to undertake and complete an engaging VR experience • demonstrate the ability to follow instructions and complete tasks as required • demonstrate the ability to interact with and learn from a number of different sources of information including visual and audio. • learn independently using the resources provided as part of the app 		

SWOT analysis			Ideal application /utilisation
	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1 ... very poor/low; 2 ... poor/low; 3 ... OK/medium; 4 ... good/high; 5 ... very good/high</p>		
	STRENGTHS	WEAKNESSES	
	<ul style="list-style-type: none"> • Wide variety of learning experiences suitable for all learners • Majority of content is free if using Oculus-based equipment • Good quality of learning content, easy to use and navigate through different apps 	<ul style="list-style-type: none"> • Some apps are better than others (e.g. The Human Brain vs <i>Titanic</i>) • Some learning content is very linear, which lessens the immersive effect of learning through VR • Limited number of apps currently 	<ul style="list-style-type: none"> • Context of ideal application <ul style="list-style-type: none"> - An effective tool for educating low-skilled and low-qualified persons about topics such as human body and brain, historical places, history, dinosaurs, the <i>Titanic</i>, space, etc. - The platform offers development of customised training programmes (as a paid service); one of the existing training apps include Forklift training which could be useful for the learners as training supporting their future employability - Useful for use in classroom-based situations where groups of learners could be taken through the individual apps supported by the trainer • Instructions for preparation <ul style="list-style-type: none"> - Have a good working knowledge of the app and the learning content to be able to objectively set the learning outcomes for each learner and also to be able to support and advise learners throughout the experience. - While not strictly necessary, ensure that all learners have sufficient space to properly use the controls. • Instructions for mentoring <ul style="list-style-type: none"> - Advise the learners about immersive VR experiences in general, although this app is suitable for beginners or less experienced learners. - Be available to the learner to offer support in case of any obstacles or to further explain the learning content/tasks.
	OPPORTUNITIES	THREATS	
	<ul style="list-style-type: none"> • Scope to add many new learning apps within Unimersiv • No similar platform/app focused on providing learning experiences • Capacity to upgrade graphics/content on a regular basis as platform is well supported 	<ul style="list-style-type: none"> • Content updates are stopped or become less regular • Linear nature of some apps provide for the possibility of limited engagement by learners • Best experienced with more expensive VR equipment, which may limit its impact for individual learners without access to this equipment 	

	<ul style="list-style-type: none">- The app can be viewed by all learners while it is running; it would be advisable to allow learners to observe the trainer undertaking the basics first.- Request feedback from learners in order to properly assess the benefits/impacts of the app and to highlight what other VR resources would be the most suitable to support the learner's further learning. <ul style="list-style-type: none">• <i>Do's and don'ts</i><ul style="list-style-type: none">- Highly advisable that learners are properly briefed on the use of the VR equipment in order to make the experience as comfortable as possible.
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VR Application Profile																					
Name of VR Application	Engage																				
Category	Platform - Various Content																				
Date of processing: 22/10/2019																					
Technical Framework & Key Data	<p>Software provider: Immersive VR Education Software developer: Immersive VR Education Version of app: 1.2</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input checked="" type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input checked="" type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: Valve Index</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p style="margin-left: 200px;">Dell Windows MR Asus Windows MR Acer Windows MR HP Windows MR</p> <p>Compatible operating systems</p> <ul style="list-style-type: none"> <input type="checkbox"/> iOS Version:..... <input type="checkbox"/> Android Version:..... <input checked="" type="checkbox"/> Other: Windows Version: 8 and later <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input checked="" type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input checked="" type="checkbox"/> Dell Visor	<input checked="" type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: Valve Index	<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Training and education platform
Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> identify core concepts and processes of learning in a VR environment
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> prepare meetings and events in VR design, build and upload recordings in a VR environment
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> prepare themselves successfully for various challenging situations in which presentation and soft skills are needed, e.g. public speaking, training large groups express and present themselves and/or prepare content adequately and successfully within such situations

<p>Activities provided</p>	<p>This app allows a variety of activities. Users can:</p> <ul style="list-style-type: none"> • have live meetings, events and VR training and collaborate live with people from all over the world as if they were there in the same room • broadcast their presentations, videos and 360-degree videos • record everything within their sessions, including their own voice, the character's movement, as well as the rest of the meeting component and all the elements used • create simple tests, feedback forms and quizzes for others and deliver them in VR during their live sessions, training and events; users can measure the learning success and learn from event attendees
<p>Added value for low-skilled/low-qualified adults</p>	<p>This app can help low-skilled and low-qualified learners to improve their verbal communication, facilitate their socialisation with peers and foster knowledge gained thanks to the available videos and documents. Furthermore, the app might encourage creativity through users designing their avatar and their clothes for meetings.</p>

<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1 ... very poor/low; 2 ... poor/low; 3 ... OK/medium; 4 ... good/high; 5 ... very good/high</p>				
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	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Its use as a platform to create documentation • The interactivity of the app supporting multiple participants at the same time in a conference • Potential development with the partners 	<ul style="list-style-type: none"> • Yet to be developed for mobile platforms • It needs the input of developers and VR teachers to improve the content • It takes a long time to connect to the environment
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application <ul style="list-style-type: none"> - Meetings and experimental classes - For sessions with many adult learners - Non-contact sessions - Team discussions - Useful for use in classroom-based situations where groups of learners could be taken through the individual apps supported by the trainer • Instructions for preparation <ul style="list-style-type: none"> - Choose the learning content you want the learners to explore from the app’s library and familiarise yourself with the learning material provided by the app. - Provide and use suitable ergonomic chairs if possible. - You can upload all kinds of documents, including videos, etc. • Instructions for mentoring 	

	<ul style="list-style-type: none"> - Have a good working knowledge of the VR app and its content so they can set learning outcomes for each learner and to support and advise the learners. • Do’s and don’ts <ul style="list-style-type: none"> - To prevent dizziness do not use for a long period of time - Pay special attention to people who have problems with dizziness, light-headedness or hypersensitivity - Leave a security space around each learner - Give a margin for joining the session and then do not interrupt
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VR Application Profile	
Name of VR Application	Within
Category	Platform - Various Content
Date of processing: 23/10/2019	
Technical Framework & Key Data	Software provider: Within Unlimited, Inc Software developer: Within Unlimited, Inc Version of app: 5.6.824
	Compatible VR hardware systems <input checked="" type="checkbox"/> Google Cardboard <input checked="" type="checkbox"/> Oculus Rift <input checked="" type="checkbox"/> Google Daydream View <input type="checkbox"/> Oculus Quest <input type="checkbox"/> Lenovo Mirage Solo <input checked="" type="checkbox"/> Samsung Gear VR <input type="checkbox"/> Lenovo Explorer <input type="checkbox"/> Samsung Odyssey <input checked="" type="checkbox"/> HTC VIVE Pro <input checked="" type="checkbox"/> PlayStation VR <input checked="" type="checkbox"/> HTC VIVE <input type="checkbox"/> Dell Visor <input type="checkbox"/> Acer AH 101 <input checked="" type="checkbox"/> Other: Gear VR <input type="checkbox"/> Oculus Go Valve Index Windows Mixed R
	Compatible operating systems <input checked="" type="checkbox"/> iOS Version: 9.0 and later <input checked="" type="checkbox"/> Android Version: 4.4 and later <input checked="" type="checkbox"/> Other: Windows 7 and later
	Languages available <input checked="" type="checkbox"/> English <input type="checkbox"/> Italian <input type="checkbox"/> Spanish <input checked="" type="checkbox"/> Other: Some content in <input checked="" type="checkbox"/> German Russian and Spanish

Learning Content	Award-winning VR documentaries, animation, music videos, horror, etc. Photo-real people and places: everything is captured with cameras or rendered CGI (computer-generated imagery).
Learning Outcomes	Learners can choose from over 100 high-quality film experiences through which they can achieve various learning outcomes. For example, the CNN documentary <i>Toro Bravo</i> :
	Knowledge
	<i>The adult learners will be able to:</i> <ul style="list-style-type: none"> explain what the running of the bulls is explain what the fiestas of Pamplona are, with <i>toros bravos</i> (bulls), etc. describe what happens in Pamplona
	Skills
	<i>The adult learners will be able to:</i> <ul style="list-style-type: none"> identify the different participants or characters of the running of the bulls: the runners, bulls, bullocks and the keepers identify a bullring, the bullfighters, the public, the horses
Competences	<i>The adult learners will be able to:</i> <ul style="list-style-type: none"> locate, identify and differentiate the different participants of Pamplona's fiesta and their relationship with the bull and the ceremony

<p>Activities provided</p>	<p>Users can choose from various content in the app, currently divided into the following: new releases, horror, documentaries, animation, experimental, music, archive.</p>																								
<p>Added value for low-skilled/low-qualified adults</p>	<p>This app is beneficial when working with low-skilled adult learners as it provides VR displays of high-quality content that facilitate their understanding and learning by educating and informing them about current issues, as well as other historical, visual and artistic facts, etc.</p>																								
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	<p>OPPORTUNITIES</p>	<p>THREATS</p>
<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> <i>Context of ideal application</i> <p>Can be used to gain broad or specific knowledge of various current topics</p> <ul style="list-style-type: none"> <i>Instructions for preparation</i> <ul style="list-style-type: none"> - Choose a topic or content to display. - Give specific instructions and didactic materials on the content in advance. - Provide and use suitable ergonomic chairs if possible. 	

- ***Instructions for mentoring***

- Trainers should work on the content in advance to help guide and advise the learners.
- Some of the content could generate further research or discussion after using the app.

- ***Do's and don'ts***

- The app can complement work on a specific topic.
- Learners can be given the opportunity to propose a topic to debate or discuss in greater depth after using the app.
- Take into account learners with certain sensitivities.



VR Application Profile																					
Name of VR Application	International Space Station Tour VR																				
Category	Space																				
Date of processing: 27/09/2019																					
Technical Framework & Key Data	<p>Software provider: Microsoft Store Software developer: The House of Fables Robaszyński-Janiec sp.j. Version of app: v1.01</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: ACER OJO500</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input type="checkbox"/> Android Version:..... <input checked="" type="checkbox"/> Other: Windows Version: Windows 10 version 10240.0 or higher</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: ACER OJO500	<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Educational tour of the International Space Station (ISS). Incredible 360 degree technology allows you to feel like an astronaut.																				

Learning Outcomes	Knowledge
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> recall the functions of the ISS recognise physical laws
	Skills
Learning Outcomes	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> navigate through a VR environment with the use of sight and hand motion
	Competences
Learning Outcomes	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> appreciate the added value of the ISS as if they were personally there
	Activities provided
	Moving between 8 modules users will discover 40 key areas of the ISS that serve as the living quarters and science laboratory for the international crew of astronauts and cosmonauts. Gain an insider’s view of what it is like to live and work on board the longest continually inhabited space station to orbit Earth.

<p>Added value for low-skilled/low-qualified adults</p>	<p>The users of this app can virtually join the European Space Agency (ESA) astronaut Samantha Cristoforetti and get the feel of being on board the International Space Station. Guided by the record holder for the longest uninterrupted space flight for a European astronaut, the low-skilled and low-qualified adult will learn, without realising, about the internal mechanisms of the International Space Station.</p>												
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	<p>OPPORTUNITIES</p>	<p>THREATS</p>
<p>ergonomic chairs</p>	<ul style="list-style-type: none"> <i>Context of ideal application</i> <p>Astronomy and physical laws training.</p> <ul style="list-style-type: none"> <i>Instructions for preparation</i> <ul style="list-style-type: none"> - It is important to prepare the VR laboratory in advance. Make sure that all software updates (operating system, drivers) are installed on each PC with a connected VR viewer. The display must be optimised for VR. - The International Space Station Tour VR software must be installed as a system administrator and the launcher icon available on the desktop. The learner will not be able to change any system settings. <i>Instructions for mentoring</i> <ul style="list-style-type: none"> - Explain the astronomy and physical laws concept using drawings etc. on the blackboard at the start of class. Explain that the VR app will show in 3D what is on the blackboard. 	

- Intervene immediately if there are any problems of a technical or learning nature.
- Prepare a short guide to explain to the learner all the steps of the activity they have to perform with the viewer and the International Space Station Tour VR software.
- At the end of the activity give users a questionnaire to assess the activity.

- ***Do's and don'ts***

Due to small delays (latencies) and small inaccuracies of the gyroscope it is good to move slowly and alternate the virtual immersion activity with pauses by removing the viewer.

VR Application Profile																					
Name of VR Application	BBC Home - A VR Spacewalk																				
Category	Space																				
Date of processing: 27/09/2019																					
Technical Framework & Key Data	<p>Software provider: BBC Software developer: BBC Media Applications Technologies Limited Version of app: 1.4</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: Valve Index</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version: <input type="checkbox"/> Android Version: <input checked="" type="checkbox"/> Other: Windows Version: 7 or higher</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: Valve Index	<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	<p>Inspired by the NASA training programs, the Spacewalk enables learners to embark on a spacewalk 250 miles above the Earth’s surface, something only 227 people have ever done for real. They are tasked with making a repair on the outside of the International Space Station, before being confronted with a terrifying emergency situation.²</p> <p>In general, the learning content is minimal but does include:</p> <ul style="list-style-type: none"> • Basic knowledge of a spacewalk • Understanding and following commands • Independent thinking in time-sensitive/dangerous situations • Critical thinking and situational analysis
Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • identify some of the core concepts and process of learning through use of VR experiences • recall some basic activities implemented by NASA during a spacewalk • relate to the importance of science and technology in spaceflight • identify the physical and emotional requirements of an astronaut during a spacewalk • recognise the responsibility and pressure of completing a defined task within a short timeframe

² <https://www.bbc.co.uk/mediacentre/latestnews/2017/vr-spacewalk>

	Skills <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • complete simple steps and tasks required to use the app and complete the spacewalk • use the VR equipment effectively in order to complete assigned tasks • analyse the situation and improvise the necessary solutions to complete defined tasks, both expected and unexpected • identify and implement effective strategies to complete the tasks under the pressures of both stress and time 	Activities provided <p>Learners are tasked with making a repair on the outside of the International Space Station, before being confronted with a terrifying emergency situation.³</p>
	Competences <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • demonstrate the ability to undertake and complete an intensive and immersive VR experience • demonstrate the ability to follow simple instructions and complete tasks as directed • demonstrate the ability to independently use the equipment required to complete the task • demonstrate the ability to work under pressure and within time-restricted deadlines 	Added value for low-skilled/low-qualified adults <p>Limited added value for low-skilled and low-qualified adults; however, the following does apply:</p> <ul style="list-style-type: none"> • Clear explanation of the tasks to be completed with narrative supports throughout the learning process; this approach supports learners in the belief that they can succeed in the completion of tasks despite obstacles faced • The learning process is straightforward with a set of simple tasks to be accomplished, with the possibility to repeat these processes and practise the tasks until they are accomplished successfully • Short and interesting learning experience; ideal for those unfamiliar with VR experiences • The app gives learners space for independent learning and makes them feel ‘responsible’ for their own actions

³ <https://www.bbc.co.uk/mediacentre/latestnews/2017/vr-spacewalk>

SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>	
	STRENGTHS	WEAKNESSES
	<ul style="list-style-type: none"> • Interesting and immersive insight into basic activities of an astronaut on the ISS; the voice guidance and narratives are of a high quality • Game is straightforward and controls are easy to master, even as a novice • Suitable for all types of learners, even those unfamiliar with gaming 	<ul style="list-style-type: none"> • Intense VR experience (even on basic settings) which can present challenges even to those familiar with VR • Only available in one language • App is limited in scope and is very linear in nature; it doesn't include any specific/practical learning content that could be practically used by learners
	OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> • Definite capacity to expand learning content • Graphics could be updated to increase engagement 	<ul style="list-style-type: none"> • Idea is easy to replicate - other 'Spacewalk' apps already available through Oculus store • App is no longer supported; no further updates will be released 	

Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application <ul style="list-style-type: none"> - Well suited as a basic introduction to learning through VR - Could be used as a taster/introduction to STEM subjects and as an introduction to space exploration - Can be used to introduce the importance of technology and science in a practical setting - Can be used as an assistive tool for users to overcome irrational fears (heights, claustrophobia, etc.) • Instructions for preparation <ul style="list-style-type: none"> - Ensure that an adequate amount of space is available for users to move around - It may be advisable to create a dedicated learning space which allows learners to feel safe and to fully engage with the immersive VR experience - The option to play the game while seated could be offered to learners. While this may lessen the impact of the VR experience, it can assist learners to overcome some of the drawback of an intense VR experience. • Instructions for mentoring <ul style="list-style-type: none"> - Advise the learners about the two options of intensity and level of difficulty. Warn learners that the experience can be uncomfortable regardless of what level of intensity they choose. - Stay in the room and support the learner in case they need any additional help.
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	<ul style="list-style-type: none">- The app can be viewed by all learners while it is running; allow learners to observe the trainer undertaking the basics first.- Request feedback from learners in order to properly assess the benefits/impacts of the app and to highlight what other VR resources would be the most suitable to support the learner's further learning. <ul style="list-style-type: none">• <i>Do's and don'ts</i><ul style="list-style-type: none">- Highly advisable that learners are properly briefed on the use of the VR equipment in order to make the experience as comfortable as possible.- Ensure that the headset is fitted correctly and that the learner's vision is not blurred/impaired, as this can exacerbate the effects of motion sickness/nauseous and will lead to a poor outcome for the learner, particularly in the context of using VR again in the future.
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VR Application Profile																					
Name of VR Application	Virtual Vocab: Spanish in VR																				
Category	Language Learning																				
Date of processing: 29/10/2019																					
Technical Framework & Key Data	<p>Software provider: Google Software developer: dragonkoiVR Version of app: 1.0</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input checked="" type="checkbox"/> Android Version: Minimum 4.4</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input checked="" type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input checked="" type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input checked="" type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input checked="" type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input checked="" type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Spanish vocabulary																				

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> explain the meaning of around 15 basic Spanish words in the context of a school and a house
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> pronounce those Spanish words as they heard them in the app
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> study independently and with initiative, as they have to select different pieces of furniture in the app to learn their name in Spanish
Activities provided	Users can virtually move through a school and a house. By looking at a certain object such as a TV, chair or painting and clicking on it, users will hear its Spanish word and can read its Spanish and English words at the same time.
Added value for low-skilled/low-qualified adults	Listening to new vocabulary and seeing the objects while hearing the words helps low-skilled adults to learn a new language more easily with the connection of sight and hearing. The small number of new words to learn in Spanish in the app can also help the target group to focus and not be overwhelmed, since the object can also be clicked on as often as needed.

SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>	
	STRENGTHS	WEAKNESSES
	<ul style="list-style-type: none"> • Hearing the vocabulary • Seeing the object while getting to know the Spanish word for it • Interactive learning environment 	<ul style="list-style-type: none"> • Very limited vocabulary offered (only two settings: school and house, and only a few objects) • Very artificial set-up (rooms do not look real) • Voice has slight American accent when pronouncing the words
	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Connecting visual and listening skills • Fun while learning new words 	<ul style="list-style-type: none"> • No added value for people who want to get to know vocabulary from different settings • Missing the feeling of ‘virtual reality’ might lead to less interest in the app • Learning vocabulary with a ‘wrong’ pronunciation

Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application <p>In a language-learning environment for low-skilled individuals</p> <ul style="list-style-type: none"> • Instructions for preparation <p>Look at the different object and click on it, to receive audio and written words.</p> <ul style="list-style-type: none"> • Instructions for mentoring <p>After using the app, review the words learned.</p> <ul style="list-style-type: none"> • Do’s and don’ts <p>Do not use the app for those who already know Spanish as there is no option to progress to different levels, and there is limited new vocabulary.</p>
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VR Application Profile																					
Name of VR Application	Google Expeditions																				
Category	World/Sites																				
Date of processing: 26/09/2019																					
Technical Framework & Key Data	<p>Software provider: Google LLC Software developer: Google Commerce Ltd Version of app: 2.3.190826066</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> iOS Version: 8.0 or later <input checked="" type="checkbox"/> Android Version: Minimum 4.4 <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input checked="" type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Expeditions to real places in the world, historic events, space or the body.																				

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • recall information on animals, places, nature and processes
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • navigate through a VR environment with the use of sight and hand motion • implement desk-research (for expeditions quiz) and self-learning (only in guide modus) independently
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • prioritise learning content through the choice of an area to explore • learn more independently, as the app fosters this in its setup with the need to self-explore an environment
Activities provided	<p>Choose a place to explore, e.g. an underwater area. Explore different scenes and learn through an audio guide or written information about the place, flora, fauna, natural phenomenon, the body, etc. by pointing on different elements in the space.</p> <p>All tours can be managed and instructed by a tour guide by use of a tablet - ideal for teaching and learning in classes.</p> <p>Users can also take an expeditions quiz.</p>

Added value for low-skilled/low-qualified adults	Users can explore places which are otherwise not physically reachable and gain a visual impression of them. They can also receive condensed information about the area through an audio guide. Low-skilled adults can particularly gain from the combination of exploring by sight and receiving information through audio.				
SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #2c3e50; color: white;"> <th style="width: 50%;">STRENGTHS</th> <th style="width: 50%;">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Exploration of places that are normally inaccessible, e.g. space, underwater, the inside of the body • Detailed information on the place, things and persons • Possibility to look around and choose places of interest </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • No movement possible in the explored space • No possibility to zoom in on points of interest • No moving object/people in the space • Expeditions quiz: users need quite some knowledge, as the answers to some questions cannot necessarily be deduced from the expeditions (picture) content </td> </tr> </tbody> </table>	STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Exploration of places that are normally inaccessible, e.g. space, underwater, the inside of the body • Detailed information on the place, things and persons • Possibility to look around and choose places of interest 	<ul style="list-style-type: none"> • No movement possible in the explored space • No possibility to zoom in on points of interest • No moving object/people in the space • Expeditions quiz: users need quite some knowledge, as the answers to some questions cannot necessarily be deduced from the expeditions (picture) content
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	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Get a vision of places which cannot be explored physically • Gain knowledge of a specific place • Explore places according to user's interest 	<ul style="list-style-type: none"> • Exploration is limited in a few particular areas • Points of interest cannot be explored in detail • Limit on the authenticity/feeling of reality of a place
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Medical training, history, geography, biology, physics education contexts • Instructions for preparation Introduction to the topic is beneficial. It might also be beneficial to consider the learning setting and choose a few destinations to explore. Since there is a wide variety of places, in a medical context, the exploration should possibly be limited to the human body, etc. • Instructions for mentoring Encourage users to look around and find places of interest where additional information is provided. 	

VR Application Profile																					
Name of VR Application	Google Earth VR																				
Category	World/Sites																				
Date of processing: 28/10/2019																					
Technical Framework & Key Data	<p>Software provider: Google Software developer: Google Version of app: 1.5</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: Valve Index</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input type="checkbox"/> Android Version:..... <input checked="" type="checkbox"/> Other: Windows 8.1 and later</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input checked="" type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: Valve Index	<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Physical and urban geography																				

Learning Outcomes	Knowledge
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • explain what the physical geography of a particular place looks like • list the different geographical features of a particular area • explain what the World Heritage Sites are
	Skills
Activities provided	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • locate various geographic incidents in a specific area of the Earth • identify the most famous monuments in each country • locate the most important rivers in the world
	Competences
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • determine the different existing landscapes in the world or in a particular area and relate it to the climate in that same area
	<p>Google Earth allows users to explore the world from totally new perspectives in VR. The app allows users to stroll the streets of Tokyo, soar over the Grand Canyon or walk around the Eiffel Tower. This app lets users see the world's cities, landmarks and natural wonders. Users can fly over a city, stand at the top of the highest peaks and even soar into space. Cinematic Earth comes with VR tours and hand-picked destinations that send users to the Amazon River, the Manhattan skyline, the Grand Canyon, the Swiss Alps, and more.</p>

<p>Added value for low-skilled/low-qualified adults</p>	<p>This app can be very interesting and beneficial when it comes to providing knowledge about physical-urban or social geography to low-skilled and low-qualified adult learners. It may be especially helpful for those who have difficulties with traditional learning methods, as the app provides an extraordinary perspective of concepts and content of physical-urban geography. It allows learners to immerse themselves in the world by exploring it at their own pace and, consequently, can improve their understanding of geography in general.</p>												
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	<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Helps users to know more about physical geography • Allows users to see cities with great clarity and as they have never seen them before • Allows a quick understanding of the topics covered 	<p>THREATS</p> <ul style="list-style-type: none"> • Not yet available on many VR glasses platforms • Users have to have some previous knowledge of geography so they don't get lost • Lack of interactivity between user and the app
<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> • <i>Context of ideal application</i> <p>Ideal for teaching and learning physical-urban and social geography, providing learners with knowledge and data that will improve their understanding of the subject in general and other more specific issues.</p> <ul style="list-style-type: none"> • <i>Instructions for preparation</i> <ul style="list-style-type: none"> - Before the lesson select what content to work on and view, in order to better adapt the content. - Didactic and pedagogical materials should be provided in advance to initiate the subject. - The app is simple and intuitive and does not need much explanation. - Provide suitable ergonomic chairs, if possible, and enough space to use the app. 	

- ***Instructions for mentoring***
 - Work on the content in advance to be able to appropriately guide and advise the learners.
 - A possible task for the learners could be to choose an ancient city and explore it, seeing the different changes it has undergone throughout its history, differentiating the typology and urban organisation of it.
 - Geographic content could generate further research or discussion after using the app

- ***Do's and don'ts***
 - The app could complement work on a specific topic.
 - Learners can be given the opportunity to propose other searches at a later session after using the app.
 - After the session, learners could solve a common problem, debate, ask questions, provide documentation, etc.
 - Take into account learners with certain sensibilities because the app requires movement. As well as situations with a certain impact

VR Application Profile																					
Name of VR Application	Wonders of the World																				
Category	World/Sites																				
Date of processing:	02/10/2019																				
Technical Framework & Key Data	<p>Software provider: MATTERVR LLC Software developer: MATTERVR LLC Version of app: 1.0.12</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input checked="" type="checkbox"/> Android Version: 5.0 (with Google VR Services) or higher</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	In Wonders of the World learners will visit a small number of the ancient wonders including the Colossus of Rhodes, the Taj Mahal and Machu Picchu. At each site they can learn about its history and its historical significance to the local area and the world through an immersive and interactive experience.																				

Learning Outcomes	Knowledge
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • identify core concepts and processes of learning through a VR experience • connect the significance of historical events/buildings to the present day • recognise what day-to-day life was like for individuals living at the time
	Skills
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • complete simple steps and tasks required to use the app and complete the tasks assigned • use the VR equipment effectively in order to complete assigned tasks • solve simple puzzles/games to obtain information relevant to the completion of tasks • navigate in an open world environment • navigate through the app including working the controls and handling interactions with NPCs (non-player characters)
Learning Outcomes	Competences
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • demonstrate the ability to undertake and complete an engaging VR experience • demonstrate the ability to follow instructions and complete tasks as required • demonstrate the ability to extract and sort information relevant to the completing of tasks • demonstrate the capacity to think critically about a number of different situations and to apply information gained in the correct context

<p>Activities provided</p>	<p>With this app users will be able to:</p> <ul style="list-style-type: none"> • visit the historical locations first hand • interact with historical individuals throughout the game • complete puzzles/games/tasks • take on the role of an individual from each time period and immerse themselves in the world
<p>Added value for low-skilled/low-qualified adults</p>	<p>While there is limited added value for low-skilled and low-qualified adults, the following do assist in making the application easy to engage with for all users:</p> <ul style="list-style-type: none"> • Clear instructions provided throughout • The app is particularly visual in nature, offering user-friendly graphics which would benefit those not used to interactive experiences or gaming • The app is learning-orientated but does so through gamification rather than through traditional learning techniques • The learning process can be implemented according to the learners’ skills and abilities, allowing for engagement with a wide audience

<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>	
	<p>STRENGTHS</p> <ul style="list-style-type: none"> • ‘Open World’ elements encourage exploration and independent learning • Not overly immersive which can alleviate any potential issues with VR/motion sickness • Learning provided for each site is interesting and encourages the user to learn 	<p>WEAKNESSES</p> <ul style="list-style-type: none"> • Only available on limited number of devices • Limited scope in learning further about each civilisation • Only available in one language
<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Could be expanded significantly, taking in other wonders • Could be ported to other operating systems or devices • Learning experience could be easily broadened with more interactivity with the environment/NPCs 	<p>THREATS</p> <ul style="list-style-type: none"> • Limited in scope, may not be of much use for experienced learners • App is now two years old, unlikely to be supported/receive further updates • Better more interactive experiences offer by other apps including Google Earth VR 	

<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> • <i>Context of ideal application</i> <ul style="list-style-type: none"> - The application can be utilised in education to further understanding about local history and the some of the most important historical places and civilisations - It can also be an effective way of introducing the learners to an interactive VR experience - Easy and user-friendly way of teaching about historical sites • <i>Instructions for preparation</i> <ul style="list-style-type: none"> - The tutor should have a good working knowledge of the app and the learning content to be able to objectively set the learning outcomes for each learner and also to be able to support and advise learners throughout the experience - While external movement will be limited it is still advisable to ensure that learners have an appropriate amount of space to move around the environment • <i>Instructions for tutoring</i> <ul style="list-style-type: none"> - The tutor should advise the learners about immersive VR experiences in general, although this app is suitable for beginners or less experienced learners - The tutor is advised to be available to the learner to offer support in case of any obstacles or to further explain the learning content / tasks - The app can be viewed by all learners while it is running, it would be advisable to allow learners to observe the tutor undertaking the basics first. 	<ul style="list-style-type: none"> - Request feedback from learners in order to properly assess the benefits/impacts of the app and to highlight what other VR resources would be the most suitable to support the learner's further learning. • <i>Do's and don'ts</i> <ul style="list-style-type: none"> - Highly advisable that learners are properly briefed on the use of the VR equipment in order to make the experience as comfortable as possible.
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VR Application Profile																					
Name of VR Application	Nanome - The future of molecular design and exploration																				
Category	Chemistry																				
Date of processing: 27/09/2019																					
Technical Framework & Key Data	<p>Software provider: Nanome on STEAM Software developer: Nanome, Inc Version of app: 1.13</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: ACER OJO500</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input type="checkbox"/> Android Version:..... <input checked="" type="checkbox"/> Other: Windows Version: 7 and upper</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: ACER OJO500	<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Chemistry and nanotechnology (chemicals and proteins)																				

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> summarise the knowledge gained with the help of atomic, molecular and protein visualisation
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> create more engaging presentations host more effective cross-site design meetings foster structural understanding across teams customise the app's virtual workspace and save VR sessions for future presenting or collaboration use the app to collaborate in real time from anywhere
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> use the app successfully to go through rapid idea generation and validation within the fields of chemistry and nanotechnology integrate the app successfully into current research workflows in these fields
Activities provided	<p>Activities provided by this app include:</p> <ul style="list-style-type: none"> loading structures from RCSB Protein Databank hosting public workspaces joining public workspaces basic molecular views basic editing features loading up to two molecules at a time

Added value for low-skilled/low-qualified adults	With this app low-skilled and low-qualified adults can learn how to manipulate chemicals and proteins with their hands, explore chemistry and nanotechnology from a completely new perspective, collaborate with others, learn and create like never before.		Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Mathematical and geometry training. 								
SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p> <table border="1" data-bbox="387 767 1111 1390"> <thead> <tr> <th data-bbox="387 767 748 802">STRENGTHS</th> <th data-bbox="748 767 1111 802">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td data-bbox="387 802 748 1066"> <ul style="list-style-type: none"> • Improves learning • Improves the spatial visualisation in Duplicate, Split, Colour molecules • Stimulates critical thinking </td> <td data-bbox="748 802 1111 1066"> <ul style="list-style-type: none"> • Dependence on the hardware platform • Discontinuous updates • Difficulty finding qualified teaching staff </td> </tr> <tr> <th data-bbox="387 1066 748 1101">OPPORTUNITIES</th> <th data-bbox="748 1066 1111 1101">THREATS</th> </tr> <tr> <td data-bbox="387 1101 748 1390"> <ul style="list-style-type: none"> • Software creation for many app fields • Links between different devices • Insert elements of AR </td> <td data-bbox="748 1101 1111 1390"> <ul style="list-style-type: none"> • Potential privacy problems • Any technical problems or delays in the app development phase • Failure to reach the required level of experience </td> </tr> </tbody> </table>		STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Improves learning • Improves the spatial visualisation in Duplicate, Split, Colour molecules • Stimulates critical thinking 	<ul style="list-style-type: none"> • Dependence on the hardware platform • Discontinuous updates • Difficulty finding qualified teaching staff 	OPPORTUNITIES	THREATS	<ul style="list-style-type: none"> • Software creation for many app fields • Links between different devices • Insert elements of AR 	<ul style="list-style-type: none"> • Potential privacy problems • Any technical problems or delays in the app development phase • Failure to reach the required level of experience 		<ul style="list-style-type: none"> • Instructions for preparation <ul style="list-style-type: none"> - It is important to prepare the VR laboratory in advance. Make sure that all software updates (operating system, drivers) are installed on each PC with a connected VR viewer. The display must be optimised for VR. - The Nanome software must be installed as a system administrator and the launcher icon available on the desktop. The learner will not be able to change any system settings. • Instructions for mentoring <ul style="list-style-type: none"> - Explain as import molecules from public databases, analyse and explore structures using drawing on the blackboard at the start of the class. Explain that the VR app will show in 3D what is on the blackboard. - Intervene immediately if there are any problems of a technical or learning nature. - Prepare a short guide to explain to the learner all the steps they must perform in the activity with the viewer and the Nanome software. - At the end of the activity give users a questionnaire to assess the activity.
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- *Do's and don'ts*

Due to small delays (latencies) and inaccuracies of the gyroscope, it is good to move slowly and alternate the virtual immersion activity with pauses by removing the viewer.

VR Application Profile																					
Name of VR Application	Google Arts & Culture																				
Category	Virtual Museum																				
Date of processing:	26/09/2019																				
Technical Framework & Key Data	<p>Software provider: Google LLC Software developer: Google Commerce Ltd Version of app: 7.2.16</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> iOS Version: Minimum 10.0 <input checked="" type="checkbox"/> Android Version: Minimum 5.0 <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> German</td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input checked="" type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input checked="" type="checkbox"/> German
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Learning Content	Arts and culture (paintings specifically)																				

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • know and differentiate between at least five famous painters and their paintings • recall background information about the era, stories and motif of a painting and being able to differentiate between them
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • navigate through a VR environment with the use of sight and hand motion
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • prioritise interests through the choice of a gallery • demonstrate holistic thinking by connecting knowledge about paintings and related era and culture • show more open-mindedness towards different cultures and backgrounds
Activities provided	Users can choose from a set of art galleries with different topics. Pick a gallery and find various paintings to explore. For each painting there is an audio guide with information on the painter, a description of the painting and era, a pictorial motif and a background story. Users can also find information text for each painting, and there is the possibility to explore the painting visually.

<p>Added value for low-skilled/low-qualified adults</p>	<ul style="list-style-type: none"> • Collection of interesting paintings and a focus on important background information such as eras and cultural characteristics. The pre-selection of the content and the assignment to different topics enables low-skilled adults to navigate through the information easily. • The information is given through an audio guide so that there is no need for high level reading skills. • Explore paintings visually without having to physically be at a museum, etc. 				
<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2 ... poor/low; 3 ... OK/medium; 4... good/high; 5... very good/high</p> <table border="1" data-bbox="385 994 1111 1391"> <thead> <tr> <th data-bbox="385 994 748 1029">STRENGTHS</th> <th data-bbox="748 994 1111 1029">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td data-bbox="385 1029 748 1391"> <ul style="list-style-type: none"> • Includes paintings from all over the world • Clear arrangement through different topics • Background information of paintings </td> <td data-bbox="748 1029 1111 1391"> <ul style="list-style-type: none"> • Limited information for each painting • Not very many interactive elements • Limited amount of paintings to explore </td> </tr> </tbody> </table>	STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Includes paintings from all over the world • Clear arrangement through different topics • Background information of paintings 	<ul style="list-style-type: none"> • Limited information for each painting • Not very many interactive elements • Limited amount of paintings to explore
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	<p>OPPORTUNITIES</p> <ul style="list-style-type: none"> • Possibility to choose galleries of interest • Learn about famous paintings and their stories and thereby develop an understanding of cultures and eras • Explore paintings visually 	<p>THREATS</p> <ul style="list-style-type: none"> • Users who already have background knowledge of content might not be provided with new information • Videos or guided tours might be more interesting • Further research must be done elsewhere
<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> • Context of ideal application In art or history education contexts or museums (to provide a wider range of possible paintings to explore) • Instructions for preparation <ul style="list-style-type: none"> - The app is quite intuitive and easy to use. - First choose a gallery topic and then a painting that interests you. • Instructions for mentoring <ul style="list-style-type: none"> - Give a short introduction on the topics of the paintings and what learner can expect. - A possible task for the learner could be to choose one gallery and explore the theme different paintings and background information in detail to gain a thorough understanding instead of trying to gather information about every topic/gallery at once. 	

- ***Do's and don'ts***

- Give a short introduction on the structure of the app in advance.
- Discuss the different exploration choices made by the learner, e.g. which galleries were chosen, which paintings were explored, and which information was the most relevant and interesting?

VR Application Profile	
Name of VR Application	Sketchfab VR
Category	Virtual Museum
Date of processing: 24/10/2019	
Technical Framework & Key Data	<p>Software provider: Sketchfab Software developer: Sketchfab Version of app: 1.5</p>
	<p>Compatible VR hardware systems</p> <p> <input checked="" type="checkbox"/> Google Cardboard <input checked="" type="checkbox"/> Oculus Rift <input checked="" type="checkbox"/> Google Daydream View <input type="checkbox"/> Oculus Quest <input type="checkbox"/> Lenovo Mirage Solo <input type="checkbox"/> Samsung Gear VR <input type="checkbox"/> Lenovo Explorer <input type="checkbox"/> Samsung Odyssey <input checked="" type="checkbox"/> HTC VIVE Pro <input type="checkbox"/> PlayStation VR <input checked="" type="checkbox"/> HTC VIVE <input type="checkbox"/> Dell Visor <input type="checkbox"/> Acer AH 101 <input checked="" type="checkbox"/> Other: Microsoft Mixed R. <input type="checkbox"/> Oculus Go </p>
	<p>Compatible operating systems</p> <p> <input checked="" type="checkbox"/> iOS Version: 9.0 and later <input checked="" type="checkbox"/> Android Version: 4.4 and later <input checked="" type="checkbox"/> Other: Windows 8 and later </p>
	<p>Languages available</p> <p> <input checked="" type="checkbox"/> English <input type="checkbox"/> Italian <input type="checkbox"/> Spanish <input type="checkbox"/> German </p>

Learning Content	Platform to publish and explore in 3D and VR: visits to museums, nature, sites, science, animals, games
Learning Outcomes	<p>This application is interesting for learning results related to the creation of 3D models and sharing them later. It is also very useful for learning about museums and works of art. The focus below is on the 3D models ‘Vincent van Gogh 3D models’.</p>
	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> describe how Vincent van Gogh lived and where name objects from his everyday life and his paintings
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> locate the works of Vincent van Gogh differentiate between the works of this artist and others identify Vincent van Gogh's way of life, through his room
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> determine the importance of Vincent van Gogh in the post-Impressionist art movement, the characteristics of the movement, and link both

<p>Activities provided</p>	<p>This app allows users to teleport to Rome, hold a beating heart or walk among dinosaurs. It allows users to discover a showcase of explorations through remote places, fantastic creatures, game worlds, cultural heritage, science and other wonders.</p>
<p>Added value for low-skilled/low-qualified adults</p>	<p>This app can be beneficial to low-skilled and low-qualified adult learners. The creativity of learners will be encouraged through creating or analysing 3D models. They will also learn from virtual visits to over 600 museums in the app.</p>

<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>				
	<table border="1"> <thead> <tr> <th data-bbox="1377 539 1731 571">STRENGTHS</th> <th data-bbox="1731 539 2096 571">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td data-bbox="1377 571 1731 1394"> <ul style="list-style-type: none"> • Offers a social platform that allows users to visualise 3D models quickly and easily • Allows users to see, touch and feel the cultural heritage in a completely innovative way and with all types of devices • Over 600 institutions and museums around the world have virtual collections on the platform </td> <td data-bbox="1731 571 2096 1394"> <ul style="list-style-type: none"> • 'Look down' menu is intrusive, making it difficult for users to enjoy anything with a floor or content underneath user • The music sounds canned and may distract users from the content • No way to freely rotate the model in front of users (pre-positioned views only), so not enough space to walk around a model </td> </tr> </tbody> </table>	STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Offers a social platform that allows users to visualise 3D models quickly and easily • Allows users to see, touch and feel the cultural heritage in a completely innovative way and with all types of devices • Over 600 institutions and museums around the world have virtual collections on the platform 	<ul style="list-style-type: none"> • 'Look down' menu is intrusive, making it difficult for users to enjoy anything with a floor or content underneath user • The music sounds canned and may distract users from the content • No way to freely rotate the model in front of users (pre-positioned views only), so not enough space to walk around a model
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	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • It can help to know more in depth concrete works of art • Can help foster creativity by making your own 3D models • The exchange and creation of 3D models is continuous and increases the content repository 	<ul style="list-style-type: none"> • Some of the applications of 3D Models are paid • Learners who don't like art can be distracted • The excess of 3D models offered does not allow perhaps to concretise a topic and we will only visualise one after another
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Useful for learning about cultural heritage. Recommended for the promotion of creative 3D models. • Instructions for preparation <ul style="list-style-type: none"> - Select in advance what to work on and visualise, in order to better adapt the content. - Didactic and pedagogical materials should be provided at the start of the class to introduce the subject. - Provide and use suitable ergonomic chairs - Ensure there is enough space for users because this app needs a lot of space for movement. 	

	<ul style="list-style-type: none"> • Instructions for mentoring <ul style="list-style-type: none"> - Prepare the content in advance so as to sufficiently guide and advise the learners. - Much of the content, particularly the cultural content, could generate further research or discussion after using the app. • Do's and don'ts <ul style="list-style-type: none"> - The app can complement work on a specific topic, e.g. in the area of Art and Culture - The learners could create some 3D models after using the app. - Be aware of learners with certain sensitivities, as the app involves movement.
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VR Application Profile																							
Name of VR Application	Notes on Blindness																						
Category	Visual Impairment																						
Date of processing: 30/10/2019																							
Technical Framework & Key Data	<p>Software provider: ARTE Experience Software developer: ARTE Experience Version of app: 4.5</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> iOS Version: 1.1 <input checked="" type="checkbox"/> Android Version: 20 <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> Other: French</td> </tr> <tr> <td><input type="checkbox"/> German</td> <td></td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Other: French	<input type="checkbox"/> German	
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<input type="checkbox"/> German																							
Learning Content	<p>A VR journey into a world beyond sight.</p> <p>After decades of steady deterioration, John Hull became totally blind.</p> <p>To help him make sense of this upheaval in his life, John began documenting his experiences on audio cassette. His</p>																						
Learning Outcomes	<p>original diary recordings form the basis of this six-part VR experience, an interactive non-fiction app using new forms of storytelling and gameplay mechanics to explore his cognitive and emotional experience of blindness.</p>																						
	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • recall the major differences between the perceptions and needs of a person who is blind and one who is not 																						
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • demonstrate empathy towards people who are blind 																						
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • raise awareness about people with disabilities and disabilities in general • demonstrate a positive attitude and respect towards people with disabilities • show respect for people with disabilities and especially for people who are blind 																						
Activities provided	<p>This app gives users the opportunity to explore John's cognitive and emotional experience of blindness through diary recordings. Each chapter addresses a memory, a moment and a specific location from John's audio diary. In this app, users get a visual spectacle of sound and how it affects the environment around someone who is blind.</p>																						

Added value for low-skilled/low-qualified adults	<p>This app can be used by anyone without difficulty. It does not require any interaction with the hardware, so learners with no prior knowledge of VR can use it. Users can watch animated chapters, experience them and reflect on what they are watching.</p>					
SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #1a237e; color: white;"> <th style="width: 50%;">STRENGTHS</th> <th style="width: 50%;">WEAKNESSES</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Ideal for beginners using VR hardware • Available in multiple VR platforms • Available for all ages (7+) </td> <td style="vertical-align: top;"> <ul style="list-style-type: none"> • Only single-user game mode available • No flexibility in content or in navigation in content to experience the app (e.g. no buttons in the app for easy navigation to the menu) • Large size of app to download </td> </tr> </tbody> </table>		STRENGTHS	WEAKNESSES	<ul style="list-style-type: none"> • Ideal for beginners using VR hardware • Available in multiple VR platforms • Available for all ages (7+) 	<ul style="list-style-type: none"> • Only single-user game mode available • No flexibility in content or in navigation in content to experience the app (e.g. no buttons in the app for easy navigation to the menu) • Large size of app to download
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	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • The VR components of this app (especially the directional sound) really help users to picture themselves as the author 	<ul style="list-style-type: none"> • Limit in sustaining interest of users if there is no structure in what the learner is required to do (purpose)
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application <ul style="list-style-type: none"> - Can be used in various adult educational contexts such as in Higher Education with students of specific programmes of studies (psychology, education with special needs, etc.). - Can also be used in other adult education training, depending on the interests and backgrounds of the learners. • Instructions for preparation <ul style="list-style-type: none"> - Internet connection is not required. The app can be used almost anywhere - it does not require any specific preparation in terms of space or location. - It is recommended that learners use the app in a quiet environment. - The app can be used with or without a VR headset (cardboard mode or smartphone mode). • Instructions for mentoring <ul style="list-style-type: none"> - Begin this activity by introducing users to the world of disability and start a class discussion. - Learners can then use the app individually. 	

	<ul style="list-style-type: none">- At the end, encourage learners to get into groups to share their feelings and opinions about what they have watched. - For a complete user experience, encourage learners to use headphones, raise the volume and increase the luminosity of their phones. <ul style="list-style-type: none">• <i>Do's and don'ts</i> <p>Initiate a discussion to introduce the theme of this app before learners use it.</p>
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VR Application Profile																					
Name of VR Application	Calcflow																				
Category	Mathematics																				
Date of processing: 27/09/2019																					
Technical Framework & Key Data	<p>Software provider: Nanome on STEAM Software developer: Nanome, Inc Version of app: 5.6.2f1</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input checked="" type="checkbox"/> Other: ACER OJO500</td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input type="checkbox"/> Android Version:..... <input checked="" type="checkbox"/> Other: Windows Version: 7 and upper</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input checked="" type="checkbox"/> Other: ACER OJO500	<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	Foundations of vector calculus																				

Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> recall the foundations of vector calculus recall parameterised functions recall integral modelling functionality
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> manipulate 3D graphs in a VR environment Experiment with mathematical modelling in a VR environment edit mathematical parameters in a VR environment
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> apply mathematical principles and knowledge more intuitively and confidently
Activities provided	Calcflow is built for anyone who wants to better understand the foundations of vector calculus. With this app learners can analyse, visualise and design vector calculus in an interactive environment. It also allows teams to collaboratively solve problems in real time.
Added value for low-skilled/low-qualified adults	This app allows users with minimal skills in the subject to study and visualise vector calculus in an interactive and accessible environment. Exploration is intuitive - just move your head!

SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>	
	STRENGTHS	WEAKNESSES
	<ul style="list-style-type: none"> • Improve learning; the app helps users to grasp the biggest ideas in vector calculus • Improves the spatial visualisation capabilities of geometric figures • Stimulates critical thinking 	<ul style="list-style-type: none"> • Dependence on the hardware platform • Discontinuous updates • The app requires qualified teaching staff in vector calculus to mentor the learning process
	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Software creation for many app fields • Links between different devices • Insert elements of AR 	<ul style="list-style-type: none"> • Potential privacy issues such as the collection of personal information • Possible malware insertions within the app update • Failure to achieve the required learning objectives

Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Mathematical and geometry training. • Instructions for preparation <ul style="list-style-type: none"> - It is important to prepare the VR laboratory in advance. Make sure that all software updates (operating system, drivers) are installed on each PC with a connected VR viewer. The display must be optimised for VR. - The Calcflow software must be installed as a system administrator and the launcher icon available on the desktop. The learner will not be able to change any system settings. • Instructions for mentoring <ul style="list-style-type: none"> - Explain the mathematical concept using drawings etc. on the blackboard at the start of class. Explain that the VR app will show in 3D what is on the blackboard. - During the use of the viewer and the app it will constantly follow the learner in analysing the mathematical concept. - Intervene immediately if there are any problems of a technical or learning nature. - Prepare a short guide for the learner explaining all the steps they must perform in the activity with the viewer and the Calcflow software. - At the end of the activity give users a questionnaire to assess the activity.
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- *Do's and don'ts*

Due to small delays (latencies) and small inaccuracies of the gyroscope it is good to move slowly and alternate the virtual immersion activity with pauses by removing the viewer.

VR Application Profile																							
Name of VR Application	Oculus Venues																						
Category	Events (sports, music, social)																						
Date of processing: 30/11/2019																							
Technical Framework & Key Data	<p>Software provider: Oculus Software developer: Oculus Version of app: 1.12.8</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:.....</p> <p><input checked="" type="checkbox"/> Android Version: 1.3.9</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> Other: Japanese</td> </tr> <tr> <td><input type="checkbox"/> German</td> <td></td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Other: Japanese	<input type="checkbox"/> German	
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Learning Content	An opportunity to be present at several different kinds of events (such as comedy shows, concerts, sporting events) in an immersive way in VR.																						

Learning Outcomes	Knowledge
	n/a
	Skills
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> demonstrate improved communication and networking skills navigate effectively through the app to access the different ‘uses’ of the app: ‘social sharing’, ‘people options’, ‘settings’, etc.
	Competences
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> show social competences and handle social interactions effectively
Activities provided	This social co-viewing app allows users to chat with their friends as they watch events around the world. It also allows multiple user interaction, which means a tutor can accompany the learner in the VR space. This app allows group interaction, which highlights the capabilities of VR.
Added value for low-skilled/low-qualified adults	This app is essentially a social rather than a learning platform, but it is a valuable one as it allows users to learn the basic skills needed within a VR environment including communication, navigation and group interaction.

SWOT analysis	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>	
	STRENGTHS	WEAKNESSES
	<ul style="list-style-type: none"> • Opportunity to experience different kinds of live events (sports events, comedy shows, etc.), from the comfort of users' own space for free, even in front seats • Amazing graphics and sense of being 'there' • Available in multiple VR platforms 	<ul style="list-style-type: none"> • Users can only access the app's content by connecting via a Facebook account • Always requires internet connection • Frequent interruptions in connections with events
	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Multiplier-game mode allowing group interaction • Social platform and interactions among users who get to participate in the same venue/event; it includes social features, so users can watch videos with 	<ul style="list-style-type: none"> • Effect of dizziness due to interruptions in the streaming when internet connection is not stable • Not always available: to use the app, users must wait until there is an event available

	<ul style="list-style-type: none"> • headset-wearing friends • Users can create their avatar representing themselves • Participating in an event which users might not be able to participate in in real life
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Introduction to a specific setting when un available to attend in person. Users can experience an event in comfort from their place of choice at the time of the event. Users with the same interests get to know each other and exchange information, interact in a safe environment and learn from others. • Instructions for preparation <ul style="list-style-type: none"> - Internet connection is required. Access to the app also requires a connection through a Facebook account. - Check in advance when available events take place, as they are only available at set times. Events are advertised in the app approximately 1-2 months in advance. • Do's and don'ts <ul style="list-style-type: none"> - Start planning in advance for specific activities so as to make the most of this app.

	<ul style="list-style-type: none">- Ensure your internet connection works properly and is stable.- Do not plan activities with your learners in case you do not know what the content will be about. Research and be familiar with the content well in advance.- Have a plan B in case the event does not load properly. Sometimes, this app does not work if the internet connection is unstable.
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VR Application Profile																							
Name of VR Application	Anne Frank House VR																						
Category	History - Second World War																						
Date of processing:	30/11/2019																						
Technical Framework & Key Data	<p>Software provider: Force Field Software developer: Force Field Version of app: 1.0</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input type="checkbox"/> Android Version:..... <input checked="" type="checkbox"/> Other: Oculus Version: 1.0</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input checked="" type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> Other: Dutch, Portuguese</td> </tr> <tr> <td><input checked="" type="checkbox"/> German</td> <td></td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input checked="" type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Other: Dutch, Portuguese	<input checked="" type="checkbox"/> German	
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Learning Content	The history of Anne Frank House. This app gives the learner an opportunity to travel back to the years of the Second World War and wander through the rooms of the Secret Annex that housed the group of eight Jewish people as they hid from the Nazis.
Learning Outcomes	Knowledge
	<i>The adult learners will be able to:</i> <ul style="list-style-type: none"> recall the story of Anne Frank and what happened to the brave inhabitants of Anne Frank House
	Skills
	<i>The adult learners will be able to:</i> <ul style="list-style-type: none"> navigate in the virtual environment to hold things and solve clues demonstrate critical thinking skills via the navigation in the virtual environment gain control of their education and learn at their own pace
Learning Outcomes	Competences
	<i>The adult learners will be able to:</i> <ul style="list-style-type: none"> tell the story of Anne Frank as if they were there personally in her house

<p>Activities provided</p>	<p>This interactive and immersive app can really transform the way educational content on this topic can be delivered. Users can interact in the app to learn the history of Anne Frank in a safe, controlled way.</p> <p>The tutor can take breaks in the interaction of users with this app so as to focus in on specific aspects of the content and then allow the learner to continue their exploration of Anne Frank’s life.</p>
<p>Added value for low-skilled/low-qualified adults</p>	<p>This app can stimulate the interest and motivation of low-skilled and low-qualified adults to engage in history and learn about the Second World War and the story of Anne Frank. This engaging app has strong gamifications characteristics which will encourage learners to learn as much as they can. As this is a single mode app, learners can learn at their own pace.</p>

<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input checked="" type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>	
	<p style="text-align: center;">STRENGTHS</p> <ul style="list-style-type: none"> • Available in various languages • No internet connection is required to use the app • Strong game-based learning element 	<p style="text-align: center;">WEAKNESSES</p> <ul style="list-style-type: none"> • Single-user game mode only • Takes up large space when downloaded • Users cannot choose what to do and see: the app follows a specific flow
<p style="text-align: center;">OPPORTUNITIES</p> <ul style="list-style-type: none"> • Learn about the Second World War and the history of Anne Frank in a really interactive way • Provides a greatly immersive environment and sense of ‘being there’ due to its realistic graphics 	<p style="text-align: center;">THREATS</p> <ul style="list-style-type: none"> • The app might cause dizziness, because of the amount of time needed to explore it fully • Limited use - probably only once or twice by each user 	

Ideal application /utilisation	<ul style="list-style-type: none"> • <i>Context of ideal application</i> Documentary and history, and educational contexts with history element. • <i>Instructions for preparation</i> <ul style="list-style-type: none"> - Have an introductory discussion before using the app. - The app works in a single game mode, so ensure there is sufficient equipment for all learners. - Learners need sufficient space to interact safely in the VR environment. • <i>Instructions for mentoring</i> Encourage breaks between the app activities to aid learners' understanding of the content and to avoid learners becoming dizzy from lengthy use of the app. • <i>Do's and don'ts</i> <ul style="list-style-type: none"> - Ensure there are enough VR devices for all participants, as the experience takes time. Alternatively, create groups that can alternate between using the VR and interacting with other relevant material. - Don't let users get too close to each other. The app requires space for participants to move around to pick up or move things.
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VR Application Profile																					
Name of VR Application	Anatomyou																				
Category	Human Body/Anatomy																				
Date of processing:	15/10/2019																				
Technical Framework & Key Data	<p>Software provider: Google Commerce Ltd Software developer: Healthware Canarias SL Version of app: 2.0.3</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> iOS Version: 9.0 or later <input checked="" type="checkbox"/> Android Version: 4.4 and up <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input checked="" type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input checked="" type="checkbox"/> Spanish	<input type="checkbox"/> German
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<input checked="" type="checkbox"/> Spanish	<input type="checkbox"/> German																				
Learning Content	Human anatomy																				

Learning Outcomes	As stated below in the section ‘Activities provided’, with this app a variety of anatomical structures can be explored and therefore various learning outcomes achieved. The learning outcomes stated below can be achieved with the free version of the app:
	Knowledge
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • explain the functionality of various parts of the circulatory, digestive, lacrimal and female reproductive system such as the functionality of the heart valves or the oesophagus, etc. • explain the exact location of various parts of these systems such as the location of the aortic arch or fallopian tube, etc. • explain the purpose of various parts of these systems such as the purpose of the tongue, the tear duct or uterus, etc.
	Skills
	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • locate and identify anatomical structures like the gastrointestinal, the female reproductive, the lacrimonasal and digestive tract as well as the arterial and venous system of the head • recognise relevant parts of the anatomical structures mentioned above from the inside and locate them in the human body
Competences	
<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • locate, identify and differentiate between the most important parts of the circulatory, digestive, lacrimal and female reproductive systems 	

<p>Activities provided</p>	<p>Using this app, the user becomes part of the anatomy in an immersive way, being able to navigate along anatomical structures like the digestive, lacrimal, female reproductive and circulatory system (arterial and venous) for free. Additional navigation routes to explore, for example, the respiratory or urinary system can be purchased.</p> <p>This app can be used in two different modes: VR and fullscreen. In VR mode users can interact with navigation controls and anatomical information elements by aiming at them.</p>
<p>Added value for low-skilled/low-qualified adults</p>	<p>This app might be beneficial when trying to impart knowledge about the human anatomy to low-skilled and low-qualified adult learners, especially those having difficulties with traditional learning methods. The app provides an extraordinary perspective of various anatomical structures. It allows the learners to immerse themselves into the human body, explore it at their own pace, and consequently it might improve the learners' understanding of the human anatomy.</p>

<p>SWOT analysis</p>	<ul style="list-style-type: none"> • User-friendliness 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Pedagogic orientation and standards 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> • Applicability level 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input type="checkbox"/> • Gamification level 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> <p>1... very poor/low; 2... poor/low; 3... OK/medium; 4... good/high; 5... very good/high</p>						
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<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> • <i>Context of ideal application</i> Ideal to enhance medical training or courses about human anatomy. • <i>Instructions for preparation</i> <ul style="list-style-type: none"> - Choose the anatomical structure you want the learners to explore and familiarise yourself with the learning material provided by the app. - Embed the application of the app in your course context and prepare further learning material about the learning subjects and/or opportunities for learners so that they can find additional information themselves. - Provide chairs (ideally revolving chairs) for the learners, since the most comfortable way to explore the app might be in a seated position. • <i>Instructions for mentoring</i> <ul style="list-style-type: none"> - Provide learners with a short introduction to the app and its functionality in advance and give the learners enough time to become familiar with its operation. - It might be useful to advise learners to regularly look at the overview picture on the left when they are using the app, so that they can identify their location in the human body during the navigation. - Make sure to clarify technical terms if needed. - After using the app it might be useful to discuss the learners' experiences. 	<ul style="list-style-type: none"> - <i>Do's and don'ts</i> - Do approach and use the app as an additional tool that can support the understanding of the human body or/and increase the learners' interest in the subject, rather than as a replacement of your own teaching. - Provide learners with enough time so that they can navigate in the human body at their own pace and repeat tours if needed.
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VR Application Profile	
Name of VR Application	Virtual Speech - VR Course
Category	Training
Date of processing:	21/10/2019
Technical Framework & Key Data	<p>Software provider: Google Commerce Ltd Software developer: VirtualSpeech Ltd Version of app: 2.24</p> <p>Compatible VR hardware systems</p> <p><input checked="" type="checkbox"/> Google Cardboard <input type="checkbox"/> Oculus Rift <input checked="" type="checkbox"/> Google Daydream View <input type="checkbox"/> Oculus Quest <input type="checkbox"/> Lenovo Mirage Solo <input checked="" type="checkbox"/> Samsung Gear VR <input type="checkbox"/> Lenovo Explorer <input type="checkbox"/> Samsung Odyssey <input type="checkbox"/> HTC VIVE Pro <input type="checkbox"/> PlayStation VR <input type="checkbox"/> HTC VIVE <input type="checkbox"/> Dell Visor <input type="checkbox"/> Acer AH 101 <input checked="" type="checkbox"/> Oculus Go</p> <p>Compatible operating systems</p> <p><input checked="" type="checkbox"/> iOS Version: 9.0 or later <input checked="" type="checkbox"/> Android Version: 5.0 and up</p> <p>Languages available</p> <p><input checked="" type="checkbox"/> English <input type="checkbox"/> Italian <input type="checkbox"/> Spanish <input type="checkbox"/> German</p>
Learning Content	Soft skills training (presentation skills, public speaking, networking, communication, etc.)

Learning Outcomes	As stated below in the section 'Activities provided' this app provides a variety of scenarios for learners to practise their soft skills, and therefore various learning outcomes can be achieved. The learning outcomes stated below can be achieved with the free version of the app:
Knowledge	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> describe how different challenging scenarios like a job interview situation, presentation scenario in a conference or meeting room, or a training delivery situation in class could look like recall at least 10 different questions which might be asked during a job interview for at least 6 different job interview situations
Skills	<p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> speak in front of people in challenging situations such as in meetings, at conferences, in front of trainees in class or an interviewer within the frame of a job interview situation hold eye contact while speaking to people in these situations better estimate the time needed for tasks such as holding a presentation or answering an interview question, etc. present themselves and answer at least 10 different job interview questions in front of an interviewer within the frame of a job interview situation

	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • prepare themselves successfully for various challenging situations in which presentation and soft skills are needed, e.g. job interview situations, public speaking • express and present themselves or/and prepared content adequately and successfully within the frame of these mentioned situations
<p>Activities provided</p>	<p>This app provides various scenarios in which users can practise their soft skills. Training rooms include public speaking, sales pitching, networking, business storytelling, media training and more. In this context the scenarios on ‘interview preparation’, ‘conference room’, ‘meeting room’ and ‘training delivery’ can be used for free. The user can enter and exit rooms by pointing the hand controller towards them and activating the trigger button or aiming the VR headset at them. The rooms provide realistic environments with realistic avatars where users can practise their own public speeches, presentations, train interview situations, etc. Depending on the room, users might be able to use provided transcripts of famous speeches for practice or be confronted with prepared questions (e.g. in the interview preparation scenario).</p> <p>On the VirtualSpeech website (www.virtualspeech.com) users can also purchase a variety of VR courses which combine traditional online classes with practice in VR. When purchasing one of the courses further features are available such as speech analyses and real-time feedback, uploading user’s own slides, eye contact rating, the opportunity to record and save speeches, and sound and visual distractions that make the environment even more realistic, etc.</p>

<p>Added value for low-skilled/low-qualified adults</p>	<p>This app might be beneficial for low-skilled and low-qualified adult learners, especially those having difficulties expressing themselves, as is often the case with migrants and refugees. Embedded in a broader training setting the app might help the learner to become more confident in speaking, while allowing learners to repeat training situations as often as needed. Specifically, the app’s ‘interview preparation’ environment might be a useful scenario for low-skilled and low-qualified adults, particularly for those who are long-term unemployed.</p>																								
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	<ul style="list-style-type: none"> Offers an app guide so users can understand how to use the app 			<ul style="list-style-type: none"> Embed the application of the app in your course context. Since the free version of the app does not provide any instructions, make sure to prepare all necessary information and instructions the learners need for their soft skills training. You might also prepare some training material for the learners. Make sure the audio of the smartphones used for the VR simulation is switched on, since the app provides sound effects to make the simulation even more realistic. Depending on the environment provide chairs (ideally revolving chairs) for the learners, e.g. for the ‘Interview Preparation’ environment a seated position might be the most realistic setting for training.
	<p>OPPORTUNITIES</p>	<p>THREATS</p>		<ul style="list-style-type: none"> Instructions for mentoring <ul style="list-style-type: none"> The app is quite intuitive and simple to use. Provide learners with a short introduction to the app and give them a few minutes to become familiar with it. Guide learners through the training process. Provide them with all necessary information in advance, give them time to practise in the VR environment what they have learned theoretically and provide them with feedback so that they can improve their performance. After using the app it might be useful to discuss the learners’ experiences.
<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> Context of ideal application Ideal to enhance any soft skills training from presentation training to public speaking to job interview training and beyond. Instructions for preparation <ul style="list-style-type: none"> Choose the virtual environment you want the learners to use for their soft skills training according to the course’s learning objective and familiarise yourself with the simulation. 			

- ***Do's and don'ts***

- Approach and use the free version of the app as a training and practice environment, rather than a comprehensive soft skills training course that can replace your own teaching.
- When analysing the learners' speeches and presentations in the free version of the app, the Voice Memo feature of the smartphones could be useful.
- Use small group or single training settings to provide learners with adequate live feedback and coaching when using the free version of the app.

VR Application Profile																								
Name of VR Application	Amazon Sumerian																							
Category	Training																							
Date of processing: 10/10/2019																								
Technical Framework & Key Data	<p>Software provider: Amazon Software developer: Amazon Version of app: N/A</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input checked="" type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lenovo Explorer</td> <td><input checked="" type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td><input type="checkbox"/> Other:.....</td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>As Sumerian is a developer platform, the apps created are compatible with most VR hardware systems.</p> <p>Compatible operating systems</p> <table border="0"> <tr> <td><input type="checkbox"/> iOS Version:.....</td> </tr> <tr> <td><input type="checkbox"/> Android Version:.....</td> </tr> <tr> <td><input checked="" type="checkbox"/> Other: Windows Version: 7 or higher recommended</td> </tr> </table> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input type="checkbox"/> Italian</td> </tr> <tr> <td><input type="checkbox"/> Spanish</td> <td><input type="checkbox"/> German</td> </tr> </table>	<input checked="" type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input checked="" type="checkbox"/> Oculus Quest	<input checked="" type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input checked="" type="checkbox"/> Lenovo Explorer	<input checked="" type="checkbox"/> Samsung Odyssey	<input checked="" type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101	<input type="checkbox"/> Other:.....	<input checked="" type="checkbox"/> Oculus Go		<input type="checkbox"/> iOS Version:.....	<input type="checkbox"/> Android Version:.....	<input checked="" type="checkbox"/> Other: Windows Version: 7 or higher recommended	<input checked="" type="checkbox"/> English	<input type="checkbox"/> Italian	<input type="checkbox"/> Spanish	<input type="checkbox"/> German
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Learning Content	<p>No learning content per se. Tutorials are provided on how to use Sumerian for its various different apps.</p> <p>Essentially, Sumerian is a service that lets users create and run 3D, AR and VR apps. You can build immersive and interactive scenes that run on AR and VR, mobile devices, and web browsers.</p>
Learning Outcomes	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • identify basic concepts behind the creation of 3D ‘scenes’ and VR apps • operate WebGL 2 and WebVR programming utilities
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • create their own 3D, VR and AR scenes and populate these with their own content including 3D ‘hosts’ • undertake some basic programming
	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • create easy-to-use VR interfaces • upload their own content to the Amazon Sumerian platform • amend and update existing ‘scenes’ on the Amazon Sumerian platform, when needed
	<p>Activities provided</p> <p>This app provides tutorials on the creation of 3D web content, and AR and VR apps.</p>

<p>Added value for low-skilled/low-qualified adults</p>	<p>The benefits of this app to low-skilled and low-qualified adults may be minimal. While the platform is relatively easy to use, some degree of proficiency in using IT/VR equipment is required. This platform is much better suited to a tutor creating content for use in a learning environment rather than being used by the end learner.</p>																	
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<p>Ideal application /utilisation</p>	<ul style="list-style-type: none"> • Context of ideal application <p>Used in teaching the creation of own VR content.</p> <ul style="list-style-type: none"> • Instructions for preparation <ul style="list-style-type: none"> - Amazon AWS account must be created. - A credit card or payment option must be chosen (even for free tier). - Access to internet and a PC/laptop required. <ul style="list-style-type: none"> • Instructions for mentoring <ul style="list-style-type: none"> - Though the content creation can be taught through the use of tool tips or tutorials, there is limited requirement for teaching. - Be well versed in the use of Sumerian and have a good understanding of the tools used for content creation. <ul style="list-style-type: none"> • Do's and don'ts <ul style="list-style-type: none"> - Sumerian would not be recommended for use with learners but instead should be used for content creation by tutor organisations or the tutors themselves.
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Additional Recommendations

VR Application Profile																							
Name of VR Application	Mondly: Learn Languages in VR																						
Category	Language Learning																						
Date of processing: 20/11/2019																							
Technical Framework & Key Data	<p>Software provider: Google Commerce Ltd Software developer: ATi Studios Version of app: 3.0.2</p> <p>Compatible VR hardware systems</p> <table border="0"> <tr> <td><input type="checkbox"/> Google Cardboard</td> <td><input checked="" type="checkbox"/> Oculus Rift</td> </tr> <tr> <td><input checked="" type="checkbox"/> Google Daydream View</td> <td><input type="checkbox"/> Oculus Quest</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Mirage Solo</td> <td><input checked="" type="checkbox"/> Samsung Gear VR</td> </tr> <tr> <td><input type="checkbox"/> Lenovo Explorer</td> <td><input type="checkbox"/> Samsung Odyssey</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE Pro</td> <td><input type="checkbox"/> PlayStation VR</td> </tr> <tr> <td><input checked="" type="checkbox"/> HTC VIVE</td> <td><input type="checkbox"/> Dell Visor</td> </tr> <tr> <td><input type="checkbox"/> Acer AH 101</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> Oculus Go</td> <td></td> </tr> </table> <p>Compatible operating systems</p> <p><input type="checkbox"/> iOS Version:..... <input checked="" type="checkbox"/> Android Version: 7.0 and up</p> <p>Languages available</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/> English</td> <td><input checked="" type="checkbox"/> Italian</td> </tr> <tr> <td><input checked="" type="checkbox"/> Spanish</td> <td><input checked="" type="checkbox"/> Other: a lot more</td> </tr> <tr> <td><input checked="" type="checkbox"/> German</td> <td></td> </tr> </table>	<input type="checkbox"/> Google Cardboard	<input checked="" type="checkbox"/> Oculus Rift	<input checked="" type="checkbox"/> Google Daydream View	<input type="checkbox"/> Oculus Quest	<input type="checkbox"/> Lenovo Mirage Solo	<input checked="" type="checkbox"/> Samsung Gear VR	<input type="checkbox"/> Lenovo Explorer	<input type="checkbox"/> Samsung Odyssey	<input checked="" type="checkbox"/> HTC VIVE Pro	<input type="checkbox"/> PlayStation VR	<input checked="" type="checkbox"/> HTC VIVE	<input type="checkbox"/> Dell Visor	<input type="checkbox"/> Acer AH 101		<input checked="" type="checkbox"/> Oculus Go		<input checked="" type="checkbox"/> English	<input checked="" type="checkbox"/> Italian	<input checked="" type="checkbox"/> Spanish	<input checked="" type="checkbox"/> Other: a lot more	<input checked="" type="checkbox"/> German	
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Learning Content	Language learning (American English, British English, German, Italian, Spanish, French, Portuguese, Chinese, Japanese, Korean, Arabic, Hindi, Vietnamese, Indonesian, Dutch, Russian, Norwegian, Danish, Swedish, Hebrew, Greek, Rumanian, Croatian, Ukrainian, Polish, Czech, Finnish, Hungarian, Thai and Turkish)
Learning Outcomes	As stated above this app supports language learning for nearly all world languages. Independent of the language chosen, the following learning outcomes can be achieved:
	<p>Knowledge</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> list at least five relevant words and phrases for each of the following topics: animals, space, vegetables and fruits list relevant phrases for various scenarios (e.g. in a train, at the hotel reception, at a restaurant) which can be used to lead a conversation
	<p>Skills</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> translate at least five relevant words and phrases for each of the following topics: animals, space, vegetables and fruit pronounce at least three relevant words and phrases for each of the following topics correctly: animals, space, vegetables and fruit translate and pronounce relevant phrases for various scenarios (e.g. in a train, at the hotel reception, at a restaurant) correctly

	<p>Competences</p> <p><i>The adult learners will be able to:</i></p> <ul style="list-style-type: none"> • lead a conversation and express oneself adequately in various scenarios (e.g. in a train, at the hotel reception, at a restaurant)
<p>Activities provided</p>	<p>In this app users can either choose between six different settings to learn vocabulary (e.g. fruit, vegetables, animals) or decide to enter one of the eight conversation scenarios by pointing the hand controller towards them and activating the trigger button.</p> <p>In all vocabulary learning settings, an avatar introduces the learners to relevant words and phrases, and invites the learners to repeat words and phrases aloud.</p> <p>In the conversation scenarios users are provided with authentic situations such as a dialog on a train to Berlin, in a taxi ride in Hong Kong, or during check-in to a hotel in Paris. In all scenarios, users can talk to avatars while relevant phrases and their translations are suggested as a guide.</p> <p>In the conversation scenarios and in the vocabulary settings immediate feedback ensures that the learners pronounce the words and phrases correctly.</p>

<p>Added value for low-skilled/low-qualified adults</p>	<p>This app might be beneficial to low-skilled and low-qualified adult learners, especially refugees and migrants who are often challenged with a completely new language and culture. Unlike traditional language learning this app allows users to learn a new language in an interactive way and to practise speaking in realistic scenarios, and consequently prepares the learners for everyday situations.</p>												
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	OPPORTUNITIES	THREATS
	<ul style="list-style-type: none"> • Can be ideal to learn the most important phrases and vocabulary for certain scenarios, e.g. scenario ‘Hotel: Reception’ • Might arouse learners’ interest for language learning • Allows learners to practice their pronunciation 	<ul style="list-style-type: none"> • Vocabulary settings might get a little bit boring after a while since the avatar is speaking really slowly • Some vocabulary settings might be not that relevant for everyday situations, e.g. setting ‘space’ • In order to learn the language properly an additional language course might be needed since the app imparts no further knowledge about grammar
Ideal application /utilisation	<ul style="list-style-type: none"> • Context of ideal application Ideal to enhance a language learning course. • Instructions for preparation <ul style="list-style-type: none"> - Choose one or more scenarios and/or vocabulary learning settings you want the learners to explore and familiarise yourself with the content. - Embed the application of the app in your course context. - Make sure that the audio and smartphones microphones used for the VR simulation are switched on so that learners can practise their pronunciation and hear the guidance of the avatars. 	

	<ul style="list-style-type: none"> - Provide chairs (ideally revolving chairs) for the learners, as the most comfortable way to explore the app might be in a seated position. • Instructions for mentoring <ul style="list-style-type: none"> - The app is quite simple to use. Provide your learners with a short introduction to the app and give them some time to watch the app tutorials so they can become familiar with its operation. - It might be useful to write down the most important phrases or vocabulary of each scenario/vocabulary learning setting. Alternatively, you could ask the learners to write them down after the VR lesson. - After using the app it might be useful to discuss the learners’ experiences and/or let them summarise what they have learned. • Do’s and don’ts <ul style="list-style-type: none"> - Approach the app as an additional learning and teaching tool which can help users to learn important phrases in a language, rather than an app which can replace a comprehensive language learning course. - To embed the app in a more comprehensive learning context, explain the grammar rules based on the phrases learned in the app or provide learners with further possibilities to enrich their vocabulary about the content they have accessed. - If the course content fits with the vocabulary learning settings provided by the app, exploring these might be an interesting way to introduce the new topic.
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	<ul style="list-style-type: none">- The app might be also a useful tool in the context of blended learning formats. Learners could, for example, be provided with certain tasks or be encouraged to use the app as a practice tool.
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