VRHealthLeaders

Training Guide

Erasmus+ Programme

2014-2020

Key Action 2: Strategic Partnership

A Multifaceted VR Learning Platform for Future Healthcare Leaders (2021-2023)

Agreement N° 2020-1-CY01-KA226-HE-082726

IO6 Training Guide

February 2022

VR Health Leaders
International Network for Health Workforce Education
PROLEPSIS INSTITUTE
silversky
mecb Driving Excellence & Innovation
HELLENIC REPUBLIC National and Kapodistrian University of Athens
POLIBIENESTAR VNIVERSITAT DE VALÈNCIA 10° aniversario
Co-funded by the Erasmus+ Programme of the European Union

Erasmus+ Programme

2014-2020

Key Action 2: Strategic Partnership

A Multifaceted VR Learning Platform for Future Healthcare Leaders (2021-2023)

Agreement N° 2020-1-CY01-KA226-HE-082726

IO6 Training Guide

February 2022

Table of Contents

1. Introduction

This training guide will provide the reader with all the tools necessary to implement the VRHealthLeaders training programme in their institution. It outlines the theoretical foundations of the project and the overarching theory that supports the selection of the 6 scenarios. The framework is outlined in detail along with the learning outcomes assigned to each scenario. The technology we have used is described for those unfamiliar with virtual reality while an implementation guide is provided outlining how our products can be used in the classroom, online and via blended learning methods.

Digital solutions have the potential to radically transform education. Using virtual reality as a primary tool for leadership training can improve healthcare systems by broadening the experiences of healthcare leaders thus providing better outcomes, services and quality to patients across the EU and beyond. Virtual reality simulation offers educators the chance to provide students with experiential learning that would otherwise not be available to them.

This project uses virtual reality to increase the leadership capabilities of future healthcare managers and policy makers using public health crises as the key theme of the training programme. Leadership education within healthcare is vital to healthcare systems. Health professionals are dealing with constant changes to both the systems they work in and the patients they serve. Equipping the health workforce with the skills to deal with this change is of pressing importance for educators, researchers, and policy makers.

2. Theoretical Foundations

After the conclusion of a literature review the project consortium utilized **screen-based simulation** theory as the primary tool for the VRHealthLeaders training toolkit. The literature suggests that where graphics, sound, and navigation emphasize the 3D nature of the environment it can enhance learning outcomes (McGrath et al, 2017). Such learning tools, coupled with **Virtual reality**, offers benefits for learners and educators, delivering cost-effective, repeatable, standardised training on demand. A large body of evidence supports VR simulation in all industries, including healthcare (Pottle, 2019), and is a powerful educational tool for defined learning objectives and implementation that is growing worldwide.

Using screen based and virtual reality tools to provide situated learning requires the integration of familiar **context** that is easily recognised by the learner (McGrath et al, 2017). It is important that such context is provided within the boundaries of participants' professional discipline, personal expertise, and within a relevant healthcare setting (Motola et al 2013). The absence of such contextual information within a training scenario impacts the accuracy of learning outcomes (Salas et al, 2013). Scenarios 1 and 2 provide such context while also presenting a high amount of relevant data which is necessary for the effective progression of the learner. Numerous articles identified the need for **control room** training within public health crises and education of leaders. A hospital emergency control room is a complex environment containing communications channels and other systems needed for accurately implementing fast decisions. These could include, but are not limited to, the following: management information systems, data charts, communication hotlines, and news on television screens (Kausar et al, 2017).

Healthcare leaders' skill gaps were also uncovered during the literature review and have been included within the six scenarios. The recent pandemic has brought with it a massive infodemic with the public being bombarded with vast quantities of information (Naeem & Bhatti, 2020). **Communication and media** training are often missing from health leadership education and have thus been included within the course because timely and credible health information is critical for improving public health outcomes (McNabb, 2009) while the general public still regard mass media as their main source of information on health issues (Chapman et al, 2017).

Operational management for healthcare leaders is crucial to navigate multi- or inter-professional wards where staff can sometimes work in silos. There is a need for healthcare managers and leaders to combine skills and knowledge of medical, nursing, and public health practitioners (Negandhi et al, 2015) while also dealing with operational issues and needing to find solutions to complex logistical problems. The management of patients must be at the centre of healthcare systems; while workforce issues must be dealt with, an issue which can be especially pertinent in a pandemic. It is for this reason that collaboration between multiple health and non-healthcare related organisations is important to ensure sufficient public health coverage for the wider population**. Inter-organisational** collaboration is increasingly prominent within contemporary healthcare systems (Aunger et al, 2021) and has been included within the training programme.

Lastly, in the context of virus induced pandemics, **vaccine hesitancy** is a growing and threatening trend. It is increasing the risk of disease outbreaks and potentially defeating health authorities' strategies (Stahl et al, 2016). The rapid pace of vaccine development, misinformation in popular and social media, the polarized socio-political environment, and the inherent complexities of large-scale vaccination efforts may undermine vaccination confidence and increase complacency about COVID-19 vaccination (Rutten et al, 2020). Overall, it has been found that healthcare leaders need more support to manage the quickly evolving vaccine environment as well as changing public perception (Paterson et al, 2016 and Dror et al, 2020).

3. Framework of the Training Program

The framework of the training has been developed based on six scenarios that reflect the background research outlined above. The framework is based on a pedagogical approach to leadership dimensions and qualities that correspond to the Healthcare Leadership Domains developed by Storey and Holti (2013). Leadership dimensions have been integrated with the six thematic areas to create scenarios that reflect the 'life' of a pandemic related health crisis at a hospital. Thus, the training programme begins with a context setting scenario and end with vaccine hesitancy. The six scenarios are outlined in detail below:

Scenario 1 – Context Setting

This scenario sets the scene for the five remaining scenarios. From a pedagogical point of view it is important to provide students with context of the curriculum, the tasks that will be involved, and the situational circumstances that this simulation is recreating. The scenario starts with a number of slides that explains what role the student is playing in the simulation (e.g. healthcare leader in a large teaching hospital with responsibility on an emergency planning board). The student is then shown a point-of-view (POV) interactive picture of someone in their own home. The student can move between their sofa and the dining room table to access various situationally relevant information. A video on the TV shows breaking news footage of an emerging pandemic caused by the Covid-19 virus. The dining room table gives access to a smartphone, laptop and notepad which all contain further information. The scenario ends with a phone call from the hospital CEO asking the learner to attend the control room at the hospital.

Scenario 2 – Emergency Control Room

In this scenario students experience the pressures of an emergency control room. All hospitals and public services have such control rooms which are used in high level emergencies to provide a space for leadership and management. This stage of the simulation will be used as an 'initiation module' where all information pertaining to the crisis is shown to the learner. For example, data on the incident is provided on the computer monitors, on papers left on the desk and via simulated workers entering or sitting at different points of the room. This data must be collected, collated and understood by the student in a time sensitive manner (10 minutes) and there is conflicting information which needs to be checked and corroborated.

Scenario 3 – Media Press Conference

Meeting the media is important for any healthcare leader during a crisis. It is often not something that healthcare practitioners who have moved into leadership roles have experienced or received training on. This scenario simulates multiple news correspondents asking challenging questions of the student. The questions are primarily based on the data that they have been presented with (via the control room simulation and a CEO briefing) before the scenario. The scenario uses a branching video aspect to add interactivity e.g. multiple choice questions after each news correspondent asks a question. The response to each question triggers further questions/follow ups and creates a total score. We can provide a 'public satisfaction' and 'political satisfaction' score based on the student's response to questions.

Scenario 4 – Ward Visit

Healthcare leaders have to work closely with healthcare practitioners to effectively make decisions that will support healthcare professionals in dealing with patients. This 360-degree simulation encourages students to engage with practitioners to better understand the needs of the patient, professionals and ward in general. The student moves around the ward room and speaks with health

professionals, the professionals will provide information in responses to questions. The student can only ask a maximum of 9 questions out of a possible 18 questions. This simulates a busy ward where healthcare professionals to not always have time to engage with healthcare leadership.

Scenario 5 – Inter-Organisational Meeting

This scenario simulates a regional policy meeting with representatives from other organisations present. The relevant authorities (local council, etc.), along with other health providers (ambulance service, care homes, etc.), attend the meeting which is chaired by the student. Using information from the previous scenarios and a policy briefing from the hospital CEU, the student must answer questions relating to issues such as policy, health workforce, planning and forecasting and inter-organisational cooperation, etc. Each answer provided by the student is graded and an overall score is given at the end of the scenario.

Scenario 6 – Vaccine Hesitancy

This scenario presents a number of interviews with members of the public who display signs of vaccine hesitancy. After each interview extra information is provided and students are asked to identify the correct policy implementation which would enable them to reduce or eliminate the risk of vaccine hesitancy in such demographics. A conceptual model of vaccine hesitancy is used to highlight the importance of the following contexts in vaccine hesitancy: knowledge & information, past experiences, perceived importance of vaccination, risk perception, subjective norms, religious & cultural beliefs.

4. Learning Outcomes

The learning outcomes of the six scenarios are linked to Storey and Holti's (2013) leadership domains and combined with key practice learning areas to create a comprehensive set of learning outcomes for each scenario. This linear approach facilitates implementation of the new training content in a stepwise manner which can be integrated into pre-existing curricula. The table below gives a brief summary of every scenario and its learning outcomes for each of the six modules:

Scenario	Key Areas Covered	Learning Outcomes
S1: Scene Setting (Introduction)	• Scene setting and background information • Understanding of wider contextual factors of leadership roles • Basic elements of leadership skills and attributes	• An understanding of the wider concept leadership of humanism • An understanding of the role that healthcare leaders have within healthcare systems and hospitals • The key attributes of leadership and core skills required for leadership development • Greater understanding of the next steps that will be taken in the training course
S2: Emergency Control Room	• Provide guidance on how to manage crisis situations within an emergency setting, where everything and everyone needs support, but prioritisation is a must to ensure an on time and effective delivery • Align on the importance of ensuring that policies and procedures are adhered to, in order to ensure that patient safety is not being compromised	• Increased confidence levels to manage crisis in emergency situations • Improved decision-making skills to determine prioritisation of multiple requirements • Increased level of communication and understanding between personnel within an emergency setting • Manage conflicting directions and requests coming through whilst ensuring the sufficient support is being given to the people in need • Retaining the focus on the delivery
S3: Media Press Conference	• Present factual and specific information to the wider general population • Understand how to convey information as a component of outbreak surveillance. • Communicate public health information to non-scientific audiences	• A greater level of self-confidence on how to respond to mass media • An understanding on how to convey health information to different users • Enrichment of knowledge on how to disseminate information in order to mitigate an emerging health crisis.
S4: Ward Visit	• Decision making during a crisis in a specific healthcare environment (hospital ward) • Engagement with practitioners to better understand the needs of the patients and the healthcare professionals	• Enhancement of emotional resilience during harsh conditions • Evaluation of conflicting and/or variable information deriving from different sources during a crisis • Team engagement in patients' treatment from different professionals • Cultivation of empathy among colleagues through the identification of conditions such as the staff burnout

S5: Inter-Organisational Meeting	• Knowledge of operational risk, the control measures taken (Strategic Planning Policy) and their impact • Operational policy in terms of impact of the policy measures • Health workforce issues including staff secondments, staff engagement etc • Planning and forecasting in terms of how the agreed measures are going to be presented to the general population and their expected acceptance	• An increase in the leadership capabilities of future healthcare managers and policy makers using public health crises • An understanding of how strategic planning works, including the different elements involved: risk management, workforce management, operational policy and planning and forecasting the policy • A greater level of self-confidence on how to deal with strategic planning policy for a public health crisis
S6: Vaccine Hesitancy	• Examine possible causes that lead to vaccine hesitancy • Investigate what can be done to tackle the factors which are related with reluctance to vaccination • Lead with care and connect your service	• Development of knowledge and skills which will help the healthcare workers to make evidence-based decisions about vaccine recommendations • Enhancement of health communication and counselling skills in order to counter resistance to vaccination • Advancement of skills on managing conflicting information from different vaccination hesitancy groups

5. Technology Used

The six scenarios are all based online with the possibility to use either a computer/laptop or a virtual reality headset. All technology can be used in the classroom, autonomously at a student's home or in a blended environment. Some of the technology may not be familiar to educators or students and has therefore been described below:

Technology	**Description**
Branching Video	Branching Scenario is a flexible content type that enables authors to present a variety of rich interactive content and choices to learners. Learners make choices that determine the content they will see.
Interactive Video	Videos may be enriched with interactivities like explanations, extra pictures, tables, Fill in the blank and multiple-choice questions. Quiz questions support adaptivity, meaning that you can jump to another part of the video based on the user's input. Interactive summaries can be added at the end of the video.
Interactive Photo	360 (equirectangular) and normal images may be enriched with interactivities like explanations, videos, sounds, and interactive questions. The images may also be linked together to give the user an impression of moving between environments or between different viewpoints within the same environment.
Virtual Reality (Computer Generated)	VR technology offers the chance to create environments not easily accessible in everyday teaching. Computer-generated virtual reality can offer educators and learners an environment where a variety of data can be presented in a life-like but gamified manner. Cues can easily be built into the environment creating greater interactivity with the learner and the VR setting.
Virtual Reality (360 Degree Video)	Immersive VR technology are ideal for educational purposes and for scientific data visualization, providing a variety of benefits beyond the traditional "desktop" approaches. Depth cues and the 360° views offered by computer-generated environments in VR allow for more pedagogical possibilities than a 2D desktop screen, especially by non-trained individuals.

6. Curriculum Implementation

Implementing the course within undergraduate or postgraduate settings can be done in almost any educational setting and is key to driving change in healthcare professionals' leadership and management development. The availability of leadership curricula is useful in guiding students and healthcare professionals through process of becoming leaders in an everchanging healthcare environment. Health professionals are dealing with constant changes to both the systems they work in and the patients they serve. Equipping the health workforce with the skills to deal with this change is of pressing importance for educators, researchers, and policy makers. This new curriculum may also help to enhance existing leadership curricula and can support interprofessional education. We have used work by Thomas et al (2016) to support the implementation process for our course:

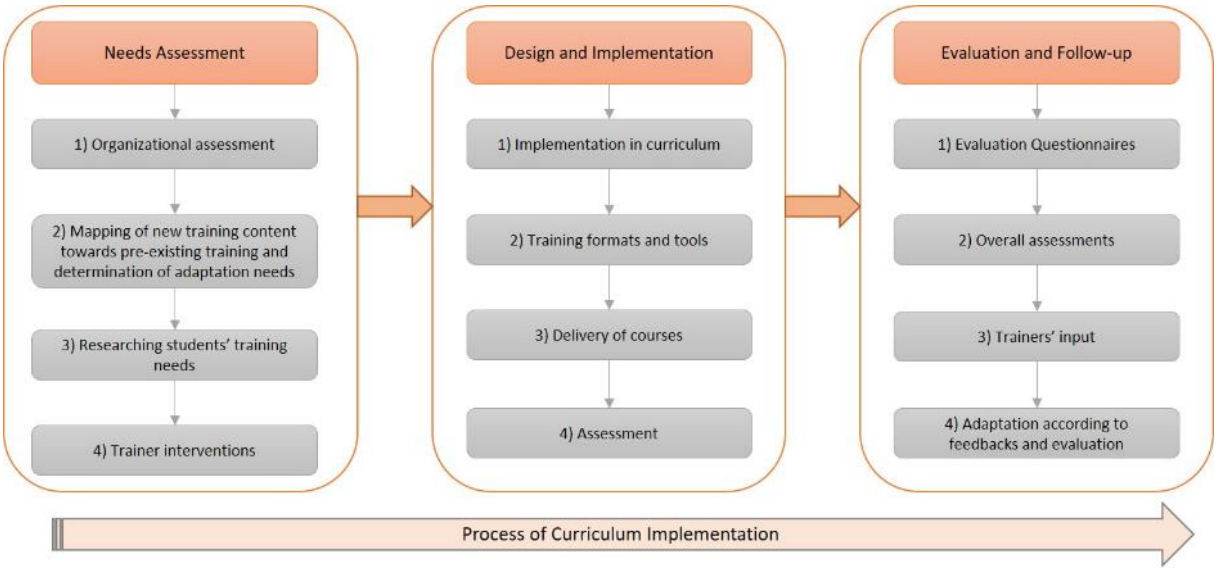

Figure 1 Process of Curriculum Implementation

Needs Assessment

A needs assessment is always crucial to ensure that any training plan can be adapted and adopted for the specific skills set of the student group. An organisational assessment must be carried out to enable our course to be conducted in a specific institution. This assessment should include operational factors such as access to virtual reality headsets, appropriate physical space to conduct the training and relevant skills for the educators themselves. The next steps should consider mapping the new training content onto pre-existing training already delivered in training and education institutions. This may either be done by conducting a scoping training session or, if available, by screening learning outcomes in specific current curricula. Lastly, training needs of the student must be understood and identified, which can be done through a variety of methods. It may be helpful to assess the need for curriculum development by conducting interviews with experienced educators in an institution, as well as consulting the students themselves. Such approaches will provide data as to where training gaps exist and how the training course can be seamlessly integrated with existing programmes.

Design and Implementation

Design and implementation accounts for the next core aspect of curriculum implementation. This focuses on training formats and tools, delivery and assessment. Implementation and assessment are covered in detail in dedicated sections of this guide. The training tools available to educators for

implementing the course are comprehensive. Along with the six scenarios, which use a mix of interactive videos and virtual reality, outlined earlier in the guide, educators also have access to a coursebook for students, an autonomous learning platform, online repository of materials and a dedicated learning course for educators. Each tool is outlined in more detail below:

- *Coursebook*: The coursebook gives educators a readymade document to send to students. This can also be edited to better serve local student groups at partner educational institutes. The coursebook is designed with the end user (educators and students) in mind to make uptake of the training course easier.

- *Online e-learning course (for educators)*: A digital leadership course has been designed and is hosted on the project website. It takes around 1 hour to complete and provides vital links with the other products developed, especially the teaching materials and virtual reality simulations.

- *Website and Online Repository*: All resources (background research, training guides, documentation, useful further information etc) have been added to the website in an easily accessible way, interlinking with the training courses.

- *Autonomous Learning Platform*: A self-learning training course for students has been developed and is interactive through the Leadership Academy toolkit (hosted on the project website). It can facilitate blended, face to face, online (synchronous and asynchronous) methods of learning as well as fully autonomous education.

Evaluation and Follow Up

During the last phase of the implementation period, it will be necessary to agree on how the impact and sustainability of the new program is conducted. This is important to understand the attitudes and skills of students, how they have changed and how they will be evaluated. Evaluation of the program is essential to inform future changes and continue to meet learners' needs. There are many models of evaluation, and it is important to choose a method that suits students, educators and the institution. It is important to reflect on what type of evaluation is appropriate based on how the course is implemented. A full training course implemented and executed as an entirely new module within a programme will require deeper evaluation than implementing a supplementary workshop within existing curricula.

7. Curriculum Application and Execution

Our project has built the first open and free healthcare virtual reality leadership simulation toolkit of its kind designed, built, and tested in a multicultural, cross-border manner. The consortium conducted a needs analysis to ensure that the training course was innovative, met the demands of healthcare educators and that it would have a meaningful impact on healthcare education in Europe. Results showed that 88.5% of respondents agreed that students prefer to learn using practical tools, but 90.9% and 87.5% agreed that they would benefit from more online educational tools for leadership and interprofessional education, respectively. We also asked survey participants to outline how they wanted to teach/learn with the results showing that many methods would be beneficial:

- Blended Learning 72
- Face to Face 49
- Online (synchronous) 22
- Online (asynchronous) 14
- All 52

It is for this reason that we have developed a training course that can be applied and executed in a number of ways. The flexibility allows educators to implement the course in a manner that suits their needs, be that the needs of students, their institution or they themselves as educators. Below we have provided some examples of how the course could be implemented:

New Module: We have provided all the tools to enable educators to create a full and brand-new leadership module. The six scenarios can be used by educators to create a full week's worth of training by extending the learning of the students and constructing a 'deep dive' into each of the 6 issues presented within our course. Group work can be set up, and extended discussion and emphasis can be placed on the learning objectives, key questions and leadership attributes outlined for each scenario. Further scenarios and discussion points could also be added to create and simulate even further detail.

Integrated into Existing Module: The training course can be integrated easily into existing courses, modules and curricula. Existing leadership or public health training programmes can be enhanced with our tools to ensure a high level of student interactives, teamwork and discussion. All six scenarios can be used, or educators can cherry-pick the scenarios that suit their current course. For example, the necessity for digital skills and data management for leaders can be highlighted using scenario 2, which could be used within a class on the subject to increase engagement.

Independent Workshop: The training programme also works well as an independent workshop with a group of leadership students. This can add value either as a stand allow session or indeed a supplementary workshop for an existing programme. The workshop would last a minimum of half a day but can be extended to 2 or 3 days up to a week. This provides an excellent chance for learners to fully immerse themselves in the simulation.

By developing a course that can be used in a variety of formats, we aimed to increasing learner interactivity and uptake with educators. Using real life scenarios aims to help learners achieve an advanced and/or expert level of leadership capabilities. One opportunity to drive learning using virtual reality and immersive learning is offered by Kolb's (1984) experimental learning cycle which is outlined below:

Kolb's experimental learning cycle

Having a concrete experiences of leadership situations followed by reflective observation should lead to learning, which will inform the next leadership experience in different circumstances. This step of the learning experience is especially important to achieving advanced and/or expert levels of understanding and education.

8. Assessment

Assessment formats for the training course can be implemented in a number of ways. The level of assessment should be proportional to the application and execution of the course and in line with the needs assessment conducted during the implementation phase. Carley (2015) states that assessment formats should be adapted and measured to the students' competence level of learning outcomes. Each implementing organisation will already have a number of standard tools for assessments which they use for student assessment and the following section aims at outlining possible additional examples of assessment formats available for the competency levels of student understanding. The question of when to introduce an assessment needs to be decided locally. The following table provides examples of possible assessment formats for the different learning strategies outlined in section 6 and 7 of this document:

Student Understanding	**Assessment Format**
Basic	Written exams (MCQ, Short answer, short essay) and/or computer-based exams, structured oral exams, further assessment by simulation and/or Objective Structured Clinical Examination (OSCE – if appropriate)
Intermediate	Written exams (MCQ, Short answer, short essay) and/or computer-based exams, structured oral exams, further assessment by simulation and/or Objective Structured Clinical Examination (OSCE – if approproate), assessment by direct observation of performance, Direct Observation of Procedural Skills (DOPS – if appropriate) etc.
Expert	Written exams (MCQ, Short answer, short essay) and/or computer-based exams, structured oral exams, further assessment by simulation and/or Objective Structured Clinical Examination (OSCE – if approproate), assessment by direct observation of performance, Direct Observation of Procedural Skills (DOPS – if appropriate) etc. Assessment by direct observation of performance using workplace-based assessment (360 Degree assessment (Bracken, Rose & Church, 2016) etc.)

Table 1 Assessment Formats

9. Curriculum Review and Update

The sustainability of the training program will be achieved through update and review by INHWE as project leader. It is the duty of INHWE and the wider project consortium to offer remote training and maintain all the training material mentioned in this guide. INHWE as host of the website and online repository will be responsible for quality assurance and evaluation of the curriculum as well as having overall responsibility for the entire training program. INHWE will also continue to promote the training course and run regular workshops at INHWE events in the future.

9. References

To follow