REPORT ON IO5: CONSOLIDATED ANALYSIS AND FRAMEWORK VALIDATION

HOTEL ACADEMY

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Deliverable [IO5] – Version [01]

Type of Activity			
IO	Intellectual Output		x
A	Project Management and Implementation		
M	Transnational Project Meeting		
E	Multiplier Event		

Nature of the deliverable		
	Feedback from participants	x
	Direct effect on participants and project partners	x
	Practical & reusable resources for the practitioners	x
	Research material bringing forward the reflexion in the sector	x
	Community building tools	
	Partnerships and Cooperation	x
	Dissemination material	x
	Organizational and working documents	

Dissemination Level			
PU	Public		x
CO	Confidential, only for members of the consortium (including the Commission Services)		

ACKNOWLEDGEMENT

List of participants

Participant No*	Participant organization name	Acronym	Country
1 (coord)	Manzavision	MZV	France
2	MBA ESG	ESG	France
3	European University Cyprus	EUC	Cyprus
4	Fachhochschule Dresden	FHD	Germany

CONTENT

Abbreviations

[DF]   Didactical Framework

1   INTRODUCTION

This report addresses the evaluation of a framework for the implementation of virtual reality (VR) role play scenarios in formal education. Based on the previous reports that included, amongst other, a literature review and the development of a didactical framework (IO1), current conclusions, recommendations, and practical experiences regarding the ways of VR implementation in the dimensions of didactics, organization, technology, economy, and culture as well as the pre-conditions and institutional requirements are identified, discussed, and integrated into a transferable set of multidimensional blueprints.

This report summarizes the results derived from the two main tasks as part of IO5:

- **O5.1 Consolidated Analysis**, incl. feedback from all project partners FHD, MVZ, ESG, EUC, and from external stakeholder from higher education and industry – Report on usage Statistics, learning success and user feedback (Comparison between the cohorts):

  Objective: Based on the analysis that has already been performed on the feedback of internal and external stakeholders at different times during the piloting (see results of IO4), the comparison of the collected data between the different cohorts give clear indications for potential implementation and adaptation of the virtual learning environment in the different institutions and beyond. *In this report, the mentioned preliminary results will be enriched with information, facts, and data regarding various VR scenarios and/or interactive role plays and/or other cross-institutional collaborations in the hospitality sector The data collection included all three different universities as well as at the coordinator*.

- **O5.2. Final recommendations** for implementation and European adoption, incl. feedback from all partners FHD, MZV, ESG, EUC, experts and professionals from the Advisory Board – Documentation and validation of the final framework:

  Objective: The consolidated analysis presented in O5.1 has been shared with experts of the projects' Advisory Board as well as with experts and professionals at the different Multiplier Events in Cyprus and France to discuss consecutive version of the didactical framework (DF). The Hotel Academy project received final approval and positive validations from experts and professionals from the field of Hospitality Management and Digital Education, provided by the Partner Consortium (ESG, EUC, FHD, MZV), the Advisory Board, and at the different Multiplier Events. *Thus, this report aims at the validation of the final framework for a didactically meaningful integration of VR role plays in the field of Hospitality Management in higher education. Additionally, to endorse European adoption of the project results, cross-institutional blueprints will be developed based on data of potential usage of the VR environment.* These blueprints demonstrate different ideal transferable implementations of VR in Hospitality Management programmes at European universities and other educational institutions.

2 THE DIDACTICAL FRAMEWORK AND VALIDATION DESIGN

2.1 DESCRIPTION OF THE DIDACTICAL FRAMEWORK (DF)

Despite the various potentials and risks of VR that have already been reported in IO1, its expansion into formal education is still slow. The peculiarity of formal education such as in vocational education or higher education is that institutions often face challenges regarding processes of standardization and regulations that can either promote or prevent educational innovations. Therefore, the consequences of these challenges in the mentioned educational context and related aspects of the implementation of VR needs to be analysed thoroughly. Thus, in this report, the following question will guide the analysis: *How can Virtual Reality be implemented sustainably in formal education?*

A respective framework for the sustainable implementation of learning and teaching innovations was proposed by Euler and Seufert (2007), which provides the conceptual and theoretical basis for the documentation and validation of the didactical framework in the Hotel Academy project. The DF will be summarized first before the readers will be introduced to the validation design. The didactical framework describes different dimensions for the implementation of innovations and, therefore, primarily supports the development and definition of innovation strategies in educational institutions (cf. Dyrna, Liebscher, Fischer & Brade, 2020).
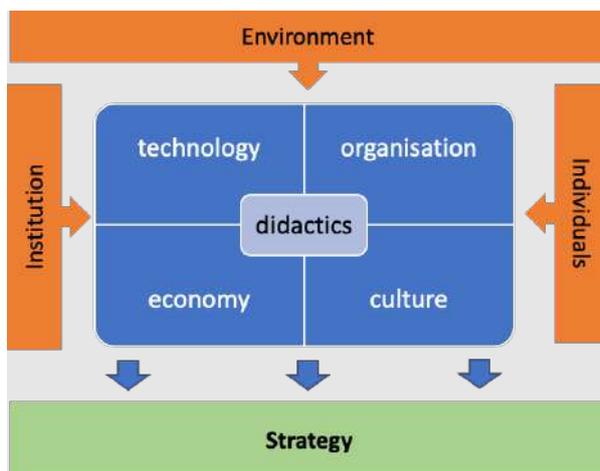

Figure 1 Framework for VR-Implementation in Formal Education (based on Euler & Seufert, 2007)

Following the main idea of the Euler-and-Seufert-framework (2007), so-called "education managers" must balance out risks and potentials of educational innovations in five main dimensions: Didactics, Organization, Technology, Economy, and Culture.

- The dimension *Didactics* focuses on the pedagogic benefit of educational innovations, the achievement of learning objectives, and the impact on curriculum design.

- The dimension *Organization* emphases the structural and procedural embedding of educational innovations in educational institutions.

- From a *Technology* perspective, aspects of IT infrastructure, IT policies, or IT governance must be considered when implementing VR in formal processes of educational institutions.

- To successfully integrate educational innovations into an institution in terms of *Economy*, costs and benefits must be balanced and existing business models be further developed.

- The dimension *Culture* describes behaviour, norms, and forms of cooperation and communication of the stakeholders. A sustainable implementation of educational innovations requires cultural adaptations and must, thus, be accompanied by change management activities.

In addition, the following three parameters must also be considered for the validation of the framework's sustainability and, respectively, for the development of institution-specific VR strategies.

- The *Education System* defines the set of rules for structures and processes in the teaching and learning setting in which VR will be used. For example, scenarios in higher education institutions are characterized by more design freedom than school scenarios.

- The *Institution* contains the equipment, existing strategies, or cultural values as well as the existing support offers. A well-developed IT infrastructure or experience in dealing with digital educational innovations, for example, facilitate the implementation of VR.

- *Individuals* are the target groups and stakeholders involved in establishing VR, e.g., it needs to be discussed: What experiences and expectations do the people involved (stakeholders) have?

The mentioned didactical framework as integral part of the Hotel Academy project has been evaluated according to the following methodological approach.

2.2 VALIDATION DESIGN

2.2.1 Procedure

The aim of this validation procedure is to analyse the strengths and weaknesses of the developed DF and its prototypes. This not only enables the project partners to get valuable feedback at an early stage and before a permanent implementation of the framework takes place but also to improve its quality and to reflect on the current learnings. Furthermore, it also helps to add a rather neutral third-person perspective based on stakeholders' opinions, meanings, and ideas inside and outside the project. The evaluation is based on a summative evaluation approach (cf. e.g., Arnold & Mayer, 2010; Scriven, 1991). More specifically, a community-based participatory research perspective (cf., e.g., Hacker, 2013) was implemented to analyse the framework based on the needs of different stakeholders in the project, to understand different use cases, to develop shared best practices, and to increase the quality of the process, implementation, and outcomes of the projects' measures. The qualitative data collection tools included questionnaires for semi-structured interviews and focus group discussions (see chapter 2.2.2).

As can be seen in Figure 2, the whole validation procedure was embedded into a reflective partitioner cycle, including **defining** the **object of research** (didactical framework), **constructing** research based on a specific **research perspective** (community-based participatory research), the **collection** and **analysis of data** (via semi-structures interviews and focus-group discussions), and the **reflection** of the findings (conclusions and blueprints) at the end of the process (**summative evaluation**).

2.2.2 Data Collection and Procedure

The data collection methods include

- **Semi-structured interviews** with different internal users and external stakeholders at the different universities (ESG, EUC, FHD) and the project coordinator (MZV) in three European member states Cyprus, France, and Germany: Based on a set of questions, each partner collected information, facts, and data regarding of up to 3 VR scenarios available and/or interactive role plays and/or other cross-institutional collaborations and/or in the hospitality and/or tourism sector. See findings in chapter 3.

- **Semi-structured focus-group discussions** were conducted with all project partners (ESG, EUC, FHD, MVZ) and with the members of the Advisory Board: The meetings explicitly focused on the evaluation of the didactical framework. See findings in chapter 4.

The interviews and discussions were guided by the questions in

Figure 3 Semi-structured guideline for interviews and discussions.
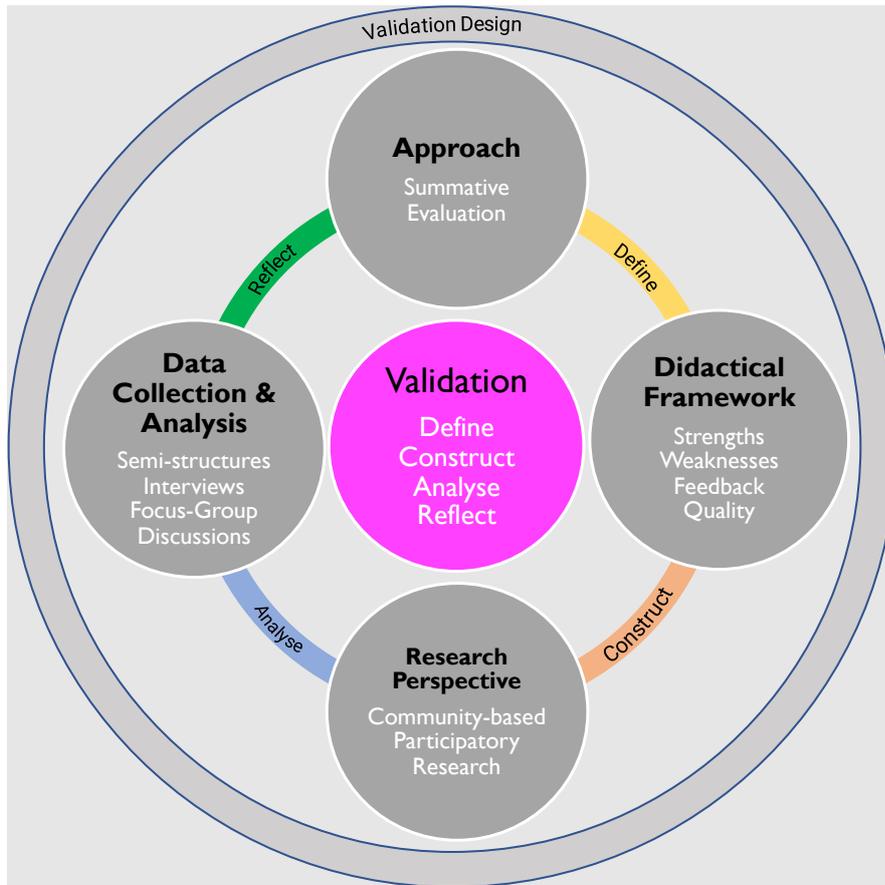
Figure 2 Framework for the Validation (based on Arnold & Rebane, 2021)

The data collection, analysis and the documentation took place according to the timeline in Table 1.

Table 1 Timeline for the IO5 Report

Activity	Month	FHD	EUC	ESG	MVZ
Planning and information of all partners	09/2021	X			
Development and test of questionnaires	09-10/2021	X			
Collection of semi-structured interviews	10-12/2021	X	X	X	X
Focus group discussion with all project partners	12/2021	X	X	X	X
Focus group discussion with Advisory Board	12/2021	X	X	X	X
Reports on IO5.1 and IO5.2	10-12/2021	X			

TECHNOLOGY

- What kind of technologies do you use in your organisation in general e.g., VR, AR, mixed reality, digital/desktop variants?
- How is the scenario* used?
- What kind of technologies are required for the use of this specific scenario*?
- Where do media disruptions occur and how are they handled?
- How will the content and the developed applications be made available for long term use?
- How do you define and ensure technological quality?
- How is the scenario* integrated into the existing infrastructure of your organisation?
- What support structures are put in place in your organisation for the use of the scenario* (e.g., IT service, technical support, qualification)?

ORGANISATION

- Who is in your organisation responsible for the development and implementation of the scenario*?
- Which actors (with which tasks) and which structures are involved in the development of the scenario*?
- How do you ensure the structural and process-related quality assurance in your organisation?
- How do you organise the process-related responsibilities and roles?

DIDACTICS

- How was or is the scenario* incorporated in the curriculum and university teaching?
- What didactic challenges existed in the implementation of the scenario* and how were these overcome?
- How are students prepared for the scenario*?
- What kind of supervision/support of students (e.g. during the scenario*) does teaching staff provide? (*teaching perspective*)
- How are different learning phases linked to one another (e.g. before, during and after the scenario*)? (*learning perspective*)
- What results or output has been achieved?
- Which impact had the scenario on different participants and/or stakeholder?
- How do you ensure the transfer of learning and results?
- How do you ensure the active participation of the participants within the scenario*?

CULTURE

- What cultural and social challenges were identified by the participants during the implementation of the scenario* and how were these taken into account?
- Which competencies do teachers need for the implementation of the scenario* and how are these taught to the teachers?
- What regular exchange formats do exist between the actors of the organisation?
- What measures have been taken to promote acceptance and create incentives for teachers and students?

ECONOMY

- What are the costs of the scenario*?
- How was the scenario financed?
- How is the financing of the infrastructure, in particular support structures, ensured?
- Does a business model exist for the long-term provision of the scenario* and how does it look like?
- How do you ensure the strategy/project controlling for an effective and efficient use of resources?

*) This could be the following: VR scenarios and/or interactive role plays and/or other cross-institutional collaborations and/or in the tourism and/or hospitality sector

Figure 3 Semi-structured guideline for interviews and discussions

3 CONSOLIDATED ANALYSIS (O5.1)

3.1 REPORT ON EXPERTS' AND PARTNERS' FEEDBACK

The consolidated analysis summarises the information and data gathered in the semi-structured interviews with internal users and external stakeholders at the different universities (ESG, EUC, FHD) and project coordinator (MZV) in three European member states Cyprus, France, and Germany. Respondents presented valuable insights on existing VR scenarios, interactive role plays, other cross-institutional collaborations in the hospitality and tourism sector regarding the five main dimensions of the DF: Didactics, Organization, Technology, Economy, and Culture.

3.1.1 Partner of ESG

Technology

- Several virtual technologies are available, e.g., Hubro Business Simulation
- The scenario is used in the way that the students get a scenario of a product and have to make decisions of investment, marketing and production based on the information the simulation creates
- The required technologies for the use of this specific scenario are just a computer with an internet connection
- Possible media disruptions mostly include failing internet connection from time to time
- The content and developed applications will be made available for long term use by continuously adding new features since the software develops every year
- Technological quality is ensured in a very efficient way with little technical concern
- About the integration of the scenario into the existing infrastructure of the organization: It is a simulation course, to which all students must participate to obtain the necessary credits to graduate
- Support structures in the organization for the use of the scenario include primarily some tutorial work by persons who help the students; no specific technical service is needed

Organization

- The professor in charge of the course is responsible for the development and implementation of the scenario within the organization
- A total of four tutors is involved for about 100 students
- The structural and process-related quality assurance in the organization is ensured by team meetings
- The process-related responsibilities and roles are organized in teamwork

Didactics

- Since the simulation is a course in itself, the incorporation of the scenario into the curriculum is without any problems or challenges
- A possible didactic challenge can be that the students do not follow the tutorial program provided before coming to the simulation
- A tutorial is provided to the students that shows how to run the simulation, the simulation is simple, but it takes time to learn
- What kind of supervision/support of students (e.g., during the scenario) does teaching staff provide? – "Ongoing support to answer all questions in order to get immediately feedback"
- How are different learning phases linked to one another? – "At each round, the students need to make decisions that will affect the next round of the simulation. With each decision, the student needs to consider the information provided to him and based on that needs to make sure that the following path is the best one available."

- Results/output: students can understand how business decisions are made based on facts and figures. After each round, the team must assess the information and results they got to be able to learn from said round to make better decisions in the future.
- The stakeholders' feedback to the simulation is very positive, even by students that have done the same simulation in previous years. They feel that the simulation is very practical, realistic, and overall allows them to apply all the different knowledge they got in different courses into just one simulation.
- The simulation is only used on students that have met the minimum requirements in terms of knowledge of management, marketing, and finance. Therefore, this simulation is only for 3rd, 4th, and 5th year students as well as master's degrees.
- About ensuring active participation of the participants within the scenario: Students must work in teams to make decisions. Without teamwork, the simulation is impossible and therefore it is the role of the tutors as well to eliminate any members that do not show up or are not participating in the team discussions.

Socio-cultural dimension

- About cultural and social challenges that were identified by the participants during the implementation of the scenario: "Because we work in an extremely multicultural class, there are cultural problems many times. Especially speaking, when there is an argument among the team, sometimes the feelings can get out of hand. It is the role of the tutor to intervene and help mediate the problems and help the students understand that it is just a communication problem and not a personal problem."
- Regarding competencies: "The teachers and tutors use must be knowledgeable in the areas of management as well as feel comfortable to approach students and provide them with feedback. We normally also have someone that can mediate any conflict that arises within the students."
- Team meetings serve as regular exchange formats between the actors of the organization
- About promoting acceptance and creating incentives for teachers and students: "At the end of the simulation, there is a small ceremony where we award the top three Groups of students an award of achievement for the competition."

Economy

- The costs of the scenario are mostly teaching fee and calculated with € 30 per student
- The scenario is financed through university budget and through funding from partner companies
- The financing through partner companies serves as a business model for the long-term provision of the scenario
- The strategy/project controlling for an effective and efficient use of resources is ensured by survey of students and partner companies

3.1.2 Partner of EUC

Technology

- VR & digital variants are available
- The scenario can be used for conflict management & decision making in the workplace
- Available software/devices: Flash card 10™ & Windows™, OneDrive for Business™
- Technical support available from MIS
- Relevant applications are integrated into existing infrastructure (MS Office 365™)

Organization

- Responsibility: the program coordinator
- Participants: Students as actors. The tasks refer to one who have a superior administrative position at school level and the other junior employees (e.g., teacher, secretary)
- Relevant theory is delivered before the process-related responsibilities and roles distribution

Didactics

- It is part of the introductory course of Educational Management
- Didactic challenges are the use of power at school level, the level of authority (rights & obligations) and the contribution of professional ethics at daily basis
- Students have a BA in Education Sciences and have acquired Rahim & Bonoma (1979) theoretical framework on managing organizational conflict
- Relevant vocabulary and reflection questions (Teaching perspective)
- Results: to be prepared to manage real conflicts at schools
- Impact: the students are astonished when they realize that they repeat obsolete behaviours of their superiors while there are new styles to manage conflicts
- Reflection: diaries provide data of reflection and guide the feedback process
- Active participation of the participants is ensured with the alteration of roles

Socio-cultural dimension

- Cultural and social challenges: aggressive behaviour to low-income workers or to women

Economy

- Costs of the scenario are included in instructor's payment and are covered by tuition fees
- For the effective and efficient use of resources and decisions about investment and implementation Flash Card Analytics is used

3.1.3 Partner of FHD

Technology

- *Used technologies (in general)*: Mixed reality, VR, AR, mobile app/tablet, development mostly with the Unity Engine™, additionally web frameworks, Ruby on Railes™, also with cloud services
- *VR trainings tools*: e.g., in the project Domicile VR, development of a VR-based learning environment for teaching of practical and communication skills in the approval and handover of apartments within the training of real estate salespersons as well as for online-supported further training close to the workplace
- *Required technologies*: VR, Google cardboard™ (mobile/VR app), server apps, web apps, multiuser environment, multidevice environment (including web browser)
- *Media disruptions and its handling*: application of approaches of user-experience-based prototyping, challenge in the implementation with the different phases are for example: lease agreement, transfer protocol at preliminary stage, transitions between media (at least 3 transitions), paper/analogue media, VR, web interface; aim is to keep media transitions as smooth as possible, projects and experiences show that switching between apps/devices could have been reduced (formerly 5-7), app-based applications (independent from server) are now available without constant server connections, interaction in web interface not required
- Availability for long term use: advantage of app-based solution instead of web application, fewer/no updates are needed, once set up no server costs are necessary, but for permanent operation student assistants are needed (at low labour costs); concept: license agreements, continuing education models could cover costs.
- *Quality control*: Most important point in quality assurance is the user-centred design based on working prototypes, strongly hypothesis-driven, and according to the development model of Scrum™ (agile software development method), every two weeks we release/updates an executable version, which will constantly be reviewed
- *Integration into existing infrastructure of organization*: Akademie für berufliche Bildung (AFBB; lead coordinator of the project): use as a digital teaching tool, in the technical learning field of the real estate specialist of the vocational training, the goal of the tool is not assessment but learning; for continuous educational training contact exist to companies who send employees

- *Need of support structures within organization*: an infrastructure is required that allows connections to be unlocked that the various devices of the participants need; VR HMD need ports, which ones are not always transparent, IT faces challenge if it wants to maintain a security-based structure, balance is needed between IT infrastructure (economic, restrictive) and content (development, teaching)

Organization

- *Main responsibility*: professor who is technological management, developer, communicative manager; closely interlocked joint requirements assessment (technical, professional, media-didactic); project management: AFBB
- *Users*: Actors and structures involved: Almost every structure from manager, professor, developer, technological designers, users, experts in real estate and law
- *Guarantee and process-related quality assurance within the organization*: most important point in quality assurance is user-centred design (detailed description see above)
- *Organization of process-related responsibilities and roles*:
  o Milestone meetings (quarterly), major work steps, and deadlines
  o First bi-weekly, then monthly meeting where everyone gets together
  o Development team: 2-3 meetings per week

Didactics

- *Didactic challenges*: operation in legally safe environments with our scenarios is important, and, therefore, a didactic concept had to be developed that allows to function independently of the permanently changing legal situation; legal situation is not technically mapped in the app, but outside in the evaluation and follow-up phase
- *Preparation for scenario*: introduction to the complete scenario, both didactically and technically, comprehensive support
- *Achieved results*: having something that can be used in everyday teaching, users almost entirely enthusiastic; teaching staff approached first with reservation, then positive evaluation; VR role plays have a strong memory effect, especially on an emotional level
- *Impact on different participants and/or stakeholders*: Stakeholder who are in contact with the main sponsor on behalf of AFBB reports great satisfaction; further investment in the project is likely: "Further benefits in the area of research and teaching in the sense of the teaching offered by the FHD, as well as visibility to the outside world, showing that application-oriented research can also be used beyond the end of the project funding period; not only theoretical results, but also sustainable, practical benefits." (informant from FHD)
- *Ensuring the transfer of learning and results*: the transfer of the project VR training to educational product is already in development
- *Guarantee for active participation of the users*: teaching staff always remains audible, there is a vocal guide available in the scenario

Socio-cultural dimension

- *Specific social and cultural challenges*, that were considered: a great variety, especially social challenge in general, which the experimentation features itself, from real estate problems, communicative challenges, whole intersection between property owner and tenant
- *Competencies teachers need for the implementation of the scenario and human resource development of teaching staff*:
  o Permanent technical assistance on-site, second person is present in the room and offers further assistance
  o Different plans need approval: *Variant 1*: further training, acquisition of software, plus didactic and technical assistant; *Variant 2*: VR lab offers training in using the tool; certified training moduls: (1) basic introduction, (2) meeting with probands, (3) final overview

- ▪ *Regular exchange formats between the actors of the organization*:
    - o Virtual and physical meetings
    - o Domicile VR app itself

Economy

- ▪ *Costs of the scenario*: FHD, for technical part EUR 200K; whole project: EUR 400K
- ▪ *Financing the scenario:* this was funded by European Social Fund (ESF), via a regional bank
- ▪ *Business model for the long-term provision of the scenario*: business model is in preparation; development and provision of paid continuous education courses.

3.1.4 Partner of MVZ

Technology

- ▪ *Kind of technology*: swap games in VR to put you in the shoes of the boss and the apprentice who arrives in the company; a virtual reality hub which allows you to watch 360° videos of trades shot on the technical platform of Ecole des metiers; a mobile app which includes quizzes, mini games and 3 serious games: one serious game on the stereotypes linked to apprenticeship, a second on the apprenticeship master/apprentice relationship, and a third one that takes place at the reception of a fast-food restaurant where an unpleasant customer wants to place an order and the objective is to complete the sale.
- ▪ *Use within the VR swap games and the mobile serious games*, which are combined with workshops and integrated within a 4-week preparation programme; there are also in parallel face-to-face roleplaying games within the workshop "Théâtre Forum" (Forum Theatre), organized by another project partner Talent Campus. It is a pedagogical modality used to manage complex situations in the customer relationship. People will start from a situation experienced by themselves. The person who has experienced the situation will replay it, he/she will play the customer who was annoying, who tried to blackmail them, etc. On the other side, one of the participants in the group tries to react as he/she would have done in the same situation. This opens up the possibilities of reactions that might have been different. The idea is to do a debriefing to identify which postures serve as a lever to unravel situations and which ones, on the contrary, aggravate the situation.
- ▪ *Required technology*: either VR headset or a mobile device depending on the game (serious or swap); digital tools can be an introduction to go further in terms of pedagogical contribution and also in terms of attractiveness, precisely for young people it is immediately something that speaks to them.
- ▪ *Long-term use*: We are currently writing a toolkit so that other training organizations can appropriate the tools developed and use them in other settings.
- ▪ *Technological quality is ensured* through technological partner MZV
- ▪ *Integration of technology within the organization*: CREATIV' leads a network of territorial actors, it is a source of proposals for project engineering and proposes to structures to move towards innovation; the Campus des Métiers et des Qualifications is a network of training establishments which has no legal structure, it is supported by CREATIV' and endorses, from a pedagogical point of view, the contents of the project to be disseminated to the training establishments that are part of the network; the scenario is not actually integrated to our organization's structure because we are not a training establishment. Within the "Cité Apprenti(e)" project, the scenarios are part of the training programme described above (Figure 1). If you would like to have the point of view of one of our partners which is a training establishment, you can contact Emmanuel ARNAL from Ecole des metiers.
- ▪ *Support structures*: As stated in the previous question, CREATIV' is not a training establishment and as such, we do not have any support structures of the kind you mention; MZV is the partner of the project who is responsible for these technical aspects. After the end of the project, if there are issues of maintenance or improvement of the tools, this will be a service to be paid to our technical partner.

Organization

- MZV is the *responsible partner* for the development of the scenario with the contribution of the trainers from Ecole des metiers in terms of contents; the implementation is carried out by the programme's trainers; also, École des metiers are involved, an apprenticeship training centre that offers training in the trades (hotel, restaurant, catering, florist, crafts), and their training experts.
- *Structural and process-related quality assurance* is guaranteed by partner École des metiers.

Didactics

- *Incorporation of the scenario in curriculum and teaching*: Ecole des metiers will be responsible, but it is too early in the project to be answered yet. They are currently in the phase of appropriation of the digital tools. In a second step, they will reflect on how to integrate the tools in a global way to their different apprenticeship programs.
- *Didactic challenges and their handling*: Since the scenario is yet to be integrated in the curriculum, it is too early in the project to describe.
- *Students' preparation*: It is the trainer who transmits the serious game to the students and there is not necessarily an introduction time, they use the tools as it is; on the contrary, for the workshop "Théâtre Forum" (Forum Theatre) the trainer always explains in the beginning the activity and participants share their experience to choose a situation for the roleplay.
- *Supervision/support of students by teaching staff (Teaching perspective)*: There is little teaching material on this type of training. In general, they work on a flip chart that is in the classroom. Overall, they leave with some leverage to unravel situations and blocking elements. They leave with ideas, but it is they who take notes. This is a point for improvement.
- *Links between learning phases (Learning perspective)*: The implementation is carried out by the programmes' trainers
- Before the beginning of the programme, students take part in 3 informational meetings and watch the 360° videos about the different trades available to be immersed in their environment and help them choose what they are interested in
- Once the programme begins, students install and use the mobile application throughout the 7 bricks that compose it; the first brick is half a day about collective information at Ecole des metiers. The second brick is 2 days to "Discover Talents"; the third brick is half a day to look for an internship, followed by the use of the swap games; the fourth brick is 2 days of workshops about "Apprentice communicator"; the fifth brick takes place at the technical platforms of Ecole des metiers for 2 days as well; the sixth brick is a 10-day internship at a company; the seventh and last brick is a day to discuss the experience feedback and use the swap games again. This 4-week programme will hopefully be followed by the signature of a contract
- *Results and outputs*: For the time being, the tools that have been created and some promotions that have been released. Number of people who have followed these scenarios increases over time. For an analysis of the results of the 4-week programme, it is yet too early in the project.
- *Impact of scenario on different participants and/or stakeholders*: There is an increase in skills on this subject for the trainers but also for us as coordinators. We realise that we should have better prepared the integration of the tools by the trainers, but we had this gap between the preparation of the programme and the availability of the tools. We had to start the first programmes without the tools being ready. If they had been integrated from the beginning, it would have been easier to appropriate them. If we were to do it again, we would have to stagger the start of the programme, with a strong focus on the development of the tools at the beginning to avoid integration as we go along.
- *Insurance of transfer of learning and results*: By the training of trainers during the project and the creation of a toolkit so that other training organizations can appropriate the tools developed and use them in other settings.

- *Insurance of active participation of the participants within the scenario*: This is part of the trainer's task. It's up to them to bring participants along so that they become actors. This is the core business of Talent Campus; they train the trainers of Ecole des metiers during the project.

Socio-cultural dimension

- *Identification of cultural and social challenges*: Participants are very far from employment, so the challenge was to bring them closer to training. They have experienced complicated things and don't have much confidence in themselves. The challenge is to get them to have enough self-confidence to see that they could learn to do this type of work. Work on everything that involves knowing how to be, behavioural knowledge, posture; it is not complicated to get students to participate because it is part of the trainers' expertise. They know that it is a difficult audience, so to overcome these difficulties he sets up small groups where there are sometimes two trainers for very few people who are constantly accompanied by the trainer.
- *Teachers' competencies*: Trainers need to have expertise in behavioural skills training, personal development training. Recruits was done in cooperation with training organizations who sent their own trainers with this mindset and made calls on external trainers specialised alike.
- *Exchange formats*: It is the technical committee and the steering committee that manage regular inter-partner meetings (MZV, Ecole des metiers, Talent Campus, etc.) within the framework of the project to assess the situation with the participants, how the training went for them, what could be improved. After definition of the course with the students, its integration into the tools is discussed. At the beginning, meetings were organised once a month, and towards the end of the project it is more like every two months.
- *Promotion of acceptance and creation of incentives for teachers and students*: Work had been done on communication, presentation of the project, meetings with partners to mobilise them in the project. For the young people, information meetings were organised outside and as close to their homes as possible, in a local community centre, town hall. Meetings enabled a playful side of Cité Apprenti(e), by testing a VR headset, by doing a quiz. The main means of communication were social networks, brochures, and visual media.

Economy

- *Costs of the scenario*: the overall budget for the project is around EUR 800K:
  o EUR 36K for 360° videos
  o EUR 162K for the mobile app with 3 serious games, quizzes, and mini games
  o EUR 34K for the swap games in VR
  o EUR 1000 per trainer per day for the workshops "Théâtre Forum" (Forum Theatre). These days correspond to the yellow bricks within the programme (Figure 1) which has been carried out a total of 11 times. For Covid reasons, some sessions were cancelled. Approximate budget of EUR 60K.
- Project financed by Caisse des Dépôts within the framework of the Plan d'Investissement dans les Compétences (PIC, Skills Investment Plan), which provides national funding for 80% of the expenses. The structures each provide 20% self-financing.
- *Financing of the infrastructure, in particular support structures*: See above, all partners of the consortium benefit from the EU grant.
- *Business model development*: No business model for the continuation of the project is developed yet. All partners from the project can benefit from the outcome (i.e., the digital tools).
- *Insurance of strategy/project controlling*: Several indicators were put in place at the beginning of the project: the number of young people contacted, the number of young people entering the preparation programme, the number of positive exits. The idea is to have a follow-up of the indicators.

4 RECOMMENDATION FOR EUROPEAN ADOPTION (O5.2)

4.1 DISCUSSION WITH ALL PROJECT PARTNERS

In December 2021, all project partners met partly virtual (EUC), partly physical (ESG, MZL, FHD) in Paris for the last official Transnational Meeting (TM) and reflected on their project's work and development to implement results in the different institutions in the future. In the following, the main findings from the analysis of this focus group discussion between the abovementioned project partners will be presented based on the five main dimensions of the didactic framework.

Technology

Media disruption: What holds learners and teachers back from using technology

The participants discussed about various *learning management systems and learning and teaching environments*: e.g., Blackboard and Moodle (EUC); apps for mobile, tablet, PC, VR, AR (MZV), they also train their customers' teams and adapt to education with research projects; apps for mobile, tablet and PC (ESG). When asked about how the individual partners would use the scenario in their higher education institutions, they highlighted possible *adaptation to other courses based on the VR role play developed in the project* (ESG, EUC, FHD); additionally, the Microsoft Innovation Center™ was mentioned as a high-tech space. ESG is interested in the distribution of the VR role play to other partner schools in Paris and within the region (ESG).

The discussion about technical problems and of any kind of media disruption that hinders students using new technologies, was related to *technical issues*. From FHD's point of view, the *audio communication quality* is at stake for the future development, as actors cannot move in the virtual room: *mimic and gestures and other body language* are relevant to communication; headset and headphones are necessary so that everyone can understand everyone. Furthermore, EUC stressed the constant need for support from an IT department, which is essential for a successful completion of the scenario. MZV supports this argument and underlined the *key requirements for the installation, the creation of accounts and the provision of access to users*.

Organization

Integration and Distribution of the VR role play in higher and vocational education

The first mentioned aspect on technology already included an exchange on how the VR role play could be integrated into the existing infrastructure of the respective partner organizations. In general, all partners will use the VR app for different courses and purposes, as it supports the learning outcomes in various university courses or modules. ESG specifically mentioned that, from a technical and organizational point of view, the introduction of VR scenarios in teaching is a huge project for their university which is own by a private educational group; but they will share the headsets and the app with another school from the same group. They also plan to use the TEEMEW app for an executive programme and for vocational training. Concerning the question on who in the organization is responsible and what actors would be involved (partners and/or anybody else), ESG said that: "The pedagogical team, the head of department and his assistant for hospitality is responsible. For the rest, it's the central pedagogical team. Two divisions: one is operations and the other one is the state certifications." In addition, EUC conclude: "We believe also that the pedagogical team will take care of it, or maybe, a combination of the university and the IT department. Each teacher will take care of the scenario development." Even though ESG and EUC belong to the same group, each country has its own rules about pedagogy. Last, but not least, for the implementation of the VR role play in the FHD, three steps need to be organized: IT supports the existing infrastructure (e.g., installations of TEEMEW app, use of WIFI), teaching staff needs to be trained by the FHD project staff, the university VR lab rents the technical equipment to the teachers.

Didactics

Collaboration between pedagogical team and IT department

To the question of how the scenario should be incorporated into the curriculum, EUC sees the VR role play as an additional element to existing courses and as a tool for demonstration in realistic environment. The main challenge of its integration is related to the communication within the scenario. While introducing this new technology, students need to get used to the tool first: "It's a matter of practice" (EUC). FHD indicated that they would use it in the study programme of touristic management, where the main challenge would be the adaption of the role play duration, its availability, and the functionality of the headsets and the server-connection. Generally, the VR role play could also be used in different other study programme in which skills in terms of communication, negotiation, argumentation is trained. These and other implemenations need to be discussed with the pedagogical team. In this context, MZV mentions that "The future of the app outside the project, integration of roleplay module to Teemew Event."

In the discussion about the supervision or support that needs to be provided to the students, EUC emphasizes: "Regarding technical matters, we have support. For the exercises, it's up to us to explain and guide the students." ESG added to this aspect the following consideration that the self-autonomy work time slots need to be explained to the students, so that they can realise the full potential of the learning exercise. "For vocational training, it would be the same, but we give them the context of the exercise with a blank exercise to test. This is taken by a theatre company part of the group, Cours Florent, to develop a VR scenario for VET (sales force). We can also use it for a four-hour masterclass" (ESG). Drawing from experiences in the previous experimentations in the Hotel Academy project, FHD has already developed an appropriate setting: "In our case, we have two people for the support (VR department) and then the teachers will support students with the preparation of the courses. We use this setting not only for VR testing, but also in other projects with media, informatics, and experimentation of new business ideas."

In the discussion about the transfer of knowledge after the project, ESG explained: "It's pretty simple for us, for VR sessions, our teachers are trained for this kind of practice and students have a debrief immediately after the experience. Grades are applied later based on a global rating. Pedagogical committee meets twice a year with our students and one meeting with professors, which allows us to transfer learning within or outside our group. Each school has its own debrief." Additionally, FHD would like to ensure that modules and learning outcomes are adapted to develop communication: "In the end, there will be an exam or a report to assess if students developed communication skills." Last, but not least, EUC sees in the debriefing and reflection of participants' experiences the best way to ensure that the learning outcomes are achieved.

Socio-cultural dimension

Development of Competencies of Teaching Staff

All partners agree that teacher's competence development is necessary for a successful integration and implementation of the VR role play into the existing infrastructure. EUC highlights that "technical direction and guidance" is of paramount importance. For example, a manual on how to use VR and guidelines to integrate the role play in the curriculum would be beneficial to support this process. Additionally, FHD mentioned: "We have a small VR lab for experimentation of new technologies that can be used for project and from teaching staff." FHD suggests that all staff involved in the VR role play (teachers, IT department, administration) should receive a training (e.g., with a train-the-trainers approach) first, before using the didactical concept and equipment developed in the Hotel Academy project. FHD already has experiences in developing train-the-trainer courses (e.g., in another Erasmus+ project GATE:VET). This would help to sustainable develop future collaboration in the university and beyond. Last, but not least, ESG applied the idea to the conditions in their university: "A training of trainers might be driven by our central IT. Building a framework for each session, e.g., 'The Riot' and 'The Unhappy Guest'." Both scenarios could be use mid-term for regular university students, and for VET students in France.

Economy

Universities need to provide structural and financial support

The partners described different financing situations and possible solutions. ESG emphasized different ways for the integration: "Four technology schools called us who have an agreement with the IT team. They are going to support it and finance it. It might not be the same for the hospitality programme, but rather for smaller volume programmes." In case of FHD, the results of the Hotel Academy project will contribute to the repertoire of the VR Lab in the university. To finance technological equipment and to develop potential use cases, they heavily rely on project funding from EU, regional or federal funds. Integration of the VR role play would be possible into two different think tanks: "We have two branches, NewWorkDesignLab.org and NewLearningDesignLab.org that will provide serviceable solutions for potential partners inside and outside the university." Similarly, EUC mentioned that they work under the same conditions as ESG, as they belong to the same group: "We have to prove the real value of this tool in order to justify the investment: buying the equipment and supporting the software." Decisions can only be made after consideration of these requirements and conditions.

4.2 ADVISORY BOARD'S FEEDBACK

A focus group discussion with the advisory board members, who are representatives of the hospitality management branch in Cyprus, France, and Germany, was conducted in December 2021. This discussion widened the data collection with specific assessments of the application and use of the VR technology and role play in professional organizations. The discussion brought to light the following findings:

1. General impression about the VR role play design and how it could be used in Hospitality Management

The TEEMEW app and the role play itself was praised by the participants as a "great tool for training, but not only for training and understanding the business that's one part of it now and how it will be made for the students to understand the real life behind the hotel operation" (Advisor 1). The role play is not simply fixed to specific situations but could be used in different hotels and for different purposes, e.g., conflict management. It was suggested that *different other scenarios could be added to the repertoire of the role play*. Furthermore, for more practical oriented training, the advisors would like to see *best practices that could be used and shared for different purposes*. For example, a recorded training scenario could be used in the onboarding of new staff. Other scenarios to be included in such training sessions would be for example: front desk interaction with customer, restaurant hosting and servicing, housekeeping procedures, events planning (for client and staff), and safety drills.

In hospitality management, future versions of the application could also include biofeedback, e.g., gestures and mimics, emotional expressions, etc. Last, but not least, the use of VR role play allows to *eliminate physical boundaries between the corporate learner and their training environment*. It also provides a way to immerse in challenging situations without putting the learner at risk (e.g., for safety, compliance tasks).

2. Other ways of using the VR role play

Another way to use the TEEMEW app and the VR role play is for *testing new assumptions and techniques to increase productivity, but also for recruiting, evaluating new hires, online onboarding training, and for discovering new properties before opening*. Besides the use in educating students, it could also be used in training of three different scenarios of (a) frontline staffs, (b) managers and (b) executives separately, and, additionally, a joint role play with all the mentioned groups being involved could be a future perspective. Larger organizations in the hospitality industry as well as outside might also be interested to use VR training platforms to implement medium- or long-term strategies such as actions for sustainability.

3. Responsible staff for the integration and support of new technology

For implementing new technologies in hotels, different people in the organization involved: for all technological and IT related questions, there is the *technical management*; for the communication of the vision and strategy and to motivate and mobilize the staff, the *general management in cooperation with the department heads*. To start the process of implementation, the CEOs or owners of the hotel need to be persuaded of the benefits to adopt the new technology. Additionally, regarding issues of motivation and training of staff, the *human resource management* must be involved in the process. In standalone hotel properties, the general management or president of the hotel is primary responsible for the integration and support of new technologies within an organization.

4. Trends and possible future development in using new technologies in the hospitality industry

VR technologies will become more important in the near future. Furthermore, the hospitality industry is a service industry which, so far, has not made full use of new high-tech tools. There are still many areas of potential use of technology in areas such as: reservations, yield management, customer relations. The advisors supported the idea that services in the hospitality sector are customer oriented which focus primarily on a personal and emotional relationship between the provider and the customer, e.g., feeling comfortable in a room, experiencing an event or natural side. Because such experiences cannot directly be reproduced by technology, it remains open how virtual services would find customers in the future.

4.3 FRAMEWORK VALIDATION

The experiences from the VR projects Hotel Academy, which are based on semi-structured interviews (in IO5.1) and focus group discussions (IO5.2) with stakeholders within and outside the project, were incorporated into the didactical framework. In the following, the criteria for a successful implementation of VR in formal education along the dimensions of didactics, organization, technology, economy, and culture will be summarized and discussed regarding the state-of-the-art in the field of Hospitality Management and digital education.

4.3.1 Didactics

Previous research focused on the learning effects and didactic design of VR, e.g., the positive learning effects of immersion, attention control, focusing, spatial perception or presence (Lee, Wong & Fung, 2010; Merchant, et al., 2014; Bailenson, 2008). With these special characteristics, VR stands out from many alternative digital forms of learning and also supports learning goals to develop cognitive, affective, and motor as well as social skills (Howard & Gutworth, 2020; Tekedere & Göker, 2016). Domains in which the training of movements and behaviour is centered benefit greatly from VR. On the other hand, however, there is a limitation that VR scenarios would automatically lead to concentration problems, cognitive overload or even VR sickness over time (Saredakis, et al., 2020). Due to the time limit of about 10-15 minutes (to avoid side-effects), VR technologies can, therefore, only be used very selectively in formal learning settings. However, this inevitably leads to media breaks, as learners must reorient themselves and to get used to the display and control technology to learn effectively. These transitions between the different learning settings (with and without VR) or between learning in analogue learning locations and in VR must be didactically planned and accompanied, but there is less information in the literature on how this should be done from a perspective of learning theory.

4.3.2 Organization

The findings show the importance of organizational implementation of VR. They focus on the processes of the technical and didactical development of VR environments, but less on its integration into formal education. Nevertheless, the integration of VR in educational offers is very demanding and intervenes deeply into the *teaching organization* itself – it requires suitable technology, rooms, and infrastructure, i.e., it is, therefore, hardly conceivable without central support. In contrast to many

other digital learning innovations, VR scenarios affect the *physical environment*, i.e., in addition to technologies, suitable rooms are also sought in which learners can move freely (Saredakis, et al., 2020). Since the use of VR is only recommendable from a pedagogical perspective and for short periods of use (see above), the *organizational effort* involved in VR development and its use compared to the learning time is significantly higher compared to alternative learning formats. In addition, special expertise is required for VR development, technological and didactical VR implementation. These human resource capacities are crucial requirements for a successful implementation. From an organizational point of view, it has a beneficial effect that the selective use of VR usually only makes up a small part of the formal educational settings. It would not necessarily require a change of *regulations or policies* (e.g., study regulations, curricula), unlike other digital learning and examination formats.

4.3.3 Technology

Overall, it can be said that many articles address the fundamental technological characteristics of VR, but without taking into consideration the specifics of formal education. The formal context indicates that institutions operate within a normative framework of *IT management* with precautionary measures for data protection and *data security*. In the training context, adaptive systems permanently use and produce sensitive user data that is worth protecting. Regarding the hardware equipment, various options can be used in terms of display and control in the VR (Sung, Chang & Liu, 2016). VR applications can be received via smartphones and cardboards, HDMs or computer screens, but positive learning effects increase with the degree of immersion and thus with the degree of *technical complexity*. The same applies to the control mechanisms. Learners can navigate in VR environments with controller, body, or eye movements, but positive learning effects correlate with the degree of immersion and presence experience. From an educational point of view, this speaks in favour of high-quality equipment. Besides this, the *physical environment* (Saredakis, et al., 2020) is essential for VR-based Learning scenarios, as it requires movement possibilities. In contrast to many other digital educational innovations the *hybrid character* of VR becomes particularly clear here, i.e., the educational technology has an impact on digital and physical space.

4.3.4 Economics

VR technologies can be used to simulate new developments but are also associated with dangers (e.g., VR-based laboratories) or limitations. In addition, scenarios can be implemented for which there is no alternative form of representation (e.g., people pass virtually through a human heart). The resulting economic advantages contrast with the comparatively high *costs of VR-development* – both for infrastructure and for staff. Due to the increasing spread of VR, the development of the costs for hardware and software (e.g., display and control technologies) is dynamic, so the necessary equipment can currently be purchased with a low budget compared to higher personnel expenses for staff. The development of VR requires a high level of *human resources* and technological expertise. The growing demand for VR from industry and science continues to lead to a shortage of human resource and to increasing staff costs. In addition to the development costs, the financial expenses for the operation of VRs, due to the equipment of hardware and software as well as the physical learning locations, are still considerably high. Overall, it can be summarized that the cost consideration of immersive VR (IVR) is currently not the focus of scientific discourse, and it needs more experiences of VR implementation to evaluate economic effects.

4.3.5 Culture

VR environments support adaptivity e.g., through customizable avatars, visualizations or positions in space and can compensate *intercultural differences* in collaborative learning scenarios. Traditional learning settings in formal education include not only teachers and students but also physical objects (e.g., material, equipment), which are usually arranged by the teacher. The control of the environment (e.g., seating arrangement) lies with the teacher. In the VR environment, this environment is configured externally by designers and programmers. This involves a *cultural change*

and a development of the attitude for teachers. The learning setting becomes significantly more complex, and the role of teachers change due to the technology. This can lead to *resistance*, which in turn makes services necessary to *support teachers* in changing their teaching practice. It can be assumed that the use of VR technologies in laboratories, makerspaces or learning locations such as libraries will increase because the teacher is supposed to play a passive role and resistance is therefore hardly to be expected.

4.3.6 Education System

Euler and Seufert (2007) mention that sets of rules for structures and processes in teaching and learning determined by the education system must also be considered. Cross-border and cross-institutional learning was beneficial inasmuch as it was perceived as enriching and future-oriented; at the same time, it likewise entailed challenges with regard to the time-zone shifts, disparities of local academic, and holiday calendars.

4.3.7 Institution

The existing institutional infrastructure has an important impact on the integration and implementation of new technologies as each institution contains equipment, existing strategies, or cultural values as well as existing support services. For example, a well-developed IT infrastructure, labs, and think tanks within the organization or expertise in dealing with digital educational innovations will strongly facilitate the implementation of VR. Nevertheless, to support digitisation processes, in the last years, an increase in specific funding for organizations to develop e-learning structures beside their ever-growing IT infrastructure was noted by all partners. In addition to the technological advancement, other aspects will increase the transformative potential for organizational changes such as staff development around technology-enhanced learning and other drivers for institutional support (e.g., Almpanis, 2015).

4.3.8 Individuals

During the project, different target groups and stakeholders involved in the implementation of VR were identified. Besides, this included the owner, general management, heads of departments, IT or technical support staff, and the teaching staff, who can have different role as shown in Table 2.

Table 2 Operationalisation of Innovative Roles (Gemünden, Salomo & Hölzle, 2007, p. 412)

Characteristics	Operationalisation
Power promoter	'The key person supports the project above-average from a higher hierarchical level.' Hierarchical rank of the key person
Expert promoter	'The key person promotes the project by his/her high technological know-how.'
Process promoter	'The key person knows the organizational processes and campaigns above-average for the smooth progress of the project.' 'The key person acts as a link between decision makers and experts.'
Technology-related relation promoter	'The key person has good relationships with important external cooperation partners.' 'The key person supports the search for external cooperation partners, information exchange with cooperation partners and the collaboration with cooperation partners.'
Market-related relationship promoter	'The key person promotes the project by his/her market-related know-how.'
Leadership experience of the project leader	Experience in leading previous projects

As discussed within the group of project partners as well as with the advisory board, the president of a hotel group, the general management, and the department heads can be seen as power promoters, while IT staff and teaching staff share similar roles as expert promoters, but with different tasks and responsibilities. Human resource managers can support the implementation as process promoters. Technology-related promoters who support the innovation process through their networking competence can be identified on the level of top management (general or operations management). Market-related relationship promoters cannot be found in the data. Leadership experiences of project leaders was discussed especially among the members of the advisory board which could be allocated to either the department heads or the staff from operations management.

4.4 CROSS-INSTITUTIONAL BLUEPRINTS: AN OUTLOOK

Finally, the aim is to identify options for action to link the corresponding dimensions of the DF and to achieve a more sustainable and didactically coherent connection between digital teaching and higher education teaching and learning. As far as possible, all relevant teaching staff within the participating universities as well as representatives of the administration and the users themselves are involved in the process of implementation. The result of such processes examined in this report support the development of an empirically grounded and practically verified blueprints, which can be transferred to other universities as a possible 'transformation path' for the planning, design, and management of sustainably digitised teaching and learning environments. In particular, the criteria, framework, and initial conditions for such a successful transfer are reflected and provided alongside the following blueprints (see Figure 5).

Blueprints describe and analyse the relationships between different components (cf. Villarroel, Bloxham, Bruna, Bruna & Herrera-Seda, 2018). In terms of the Hotel Academy project the blueprints were developed based on the dimensions of the didactical framework: Didactics, Organization, Technology, Economy, and Culture. Furthermore, the requirements from the different education systems, institutions, and individual needs were taken into consideration (see results in the previous section of this report). The blueprints emerged from the following four consecutive steps:
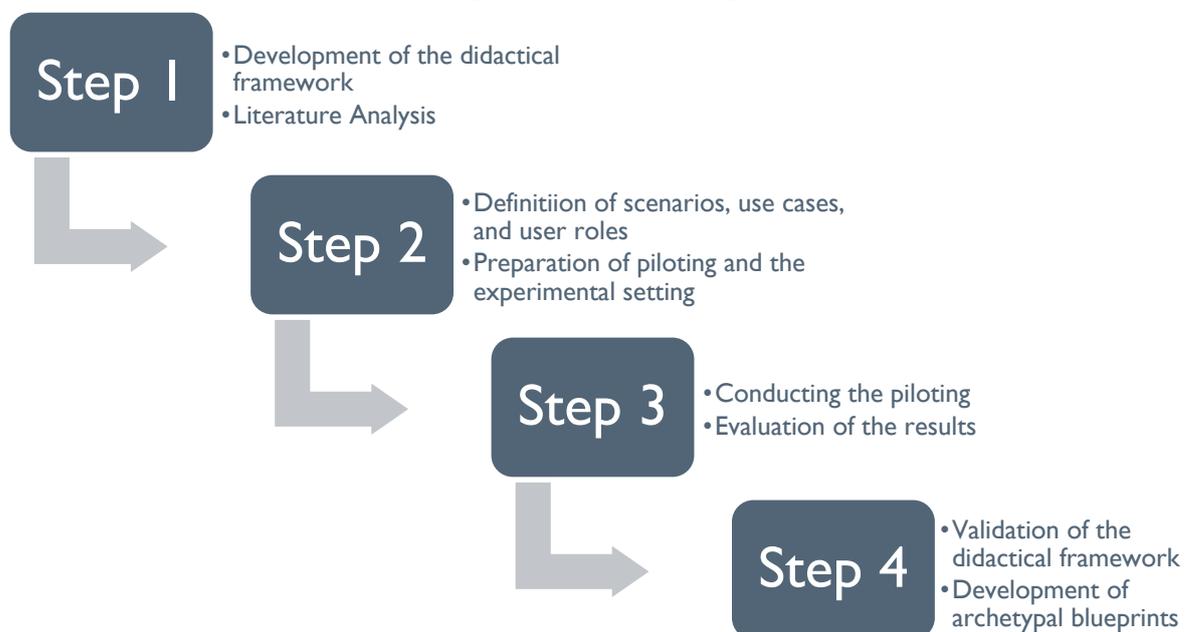

Step 1
- Development of the didactical framework
- Literature Analysis

Step 2
- Definitiion of scenarios, use cases, and user roles
- Preparation of piloting and the experimental setting

Step 3
- Conducting the piloting
- Evaluation of the results

Step 4
- Validation of the didactical framework
- Development of archetypal blueprints

Figure 4 Steps for the development of the blueprints (adopted from Villarroel, et al., 2018, p. 847)

The three blueprints recommended for the implementation and adoption into other European higher education institutions are as follows:

- **Prototyper**: This approach uses an experimental setting to include new technologies into the institution. At an early stage of the development of new models for teaching and organizational change, products were designed and tested during their introduction into the educational environments. An ideal prototyping procedure includes at least the following steps: (a) identifying the problem, challenges, and barriers that need to be solved or changed; (b) ideation helps to brainstorm possible ideas for the implementation of the new technologies; (c) prototypes will ensure the development and adoption of new concepts and approaches; (d) regular evaluation and assessment of the pros and cons of the newly developed prototypes will help to optimize it over time and support an early integration into the existing infrastructure.

- **Synergist**: This approach highlights the case that more advanced higher education institutions will be able to integrate new technological and didactical concepts into already existing labs and specialised departments, programmes, and projects. For example, an already existing mixed reality lab can provide necessary basic IT support, has expertise gained in other projects to support the integration of new didactical steps. Additionally, it needs also to be considered that analogue and digital approaches, methods, and technologies, such as new work design, new learning paradigms, future of work, Open Educational Resources, and peer-coaching must be thought together and 'synthesized' and 'integrated' within the organization. Finding synergies involves cooperation between different actors and departments and working on integral goals.

- **Multiplier**: This approach can be best described by the effect that experienced experts, teams, and organizations can amplify ideas, concepts, methods to a wide-ranging audience that can adopt new technologies in their institutions. In other words, a multiplier is an institution that distributes the solutions to others to let them perform better in the future. For example, the VR role play developed in this project may also be applied into other educational institutions such as in vocational education and any other education programme that follows similar learning outcomes (e.g., where students are equipped with communicative skills, teamwork approaches, and social skills).
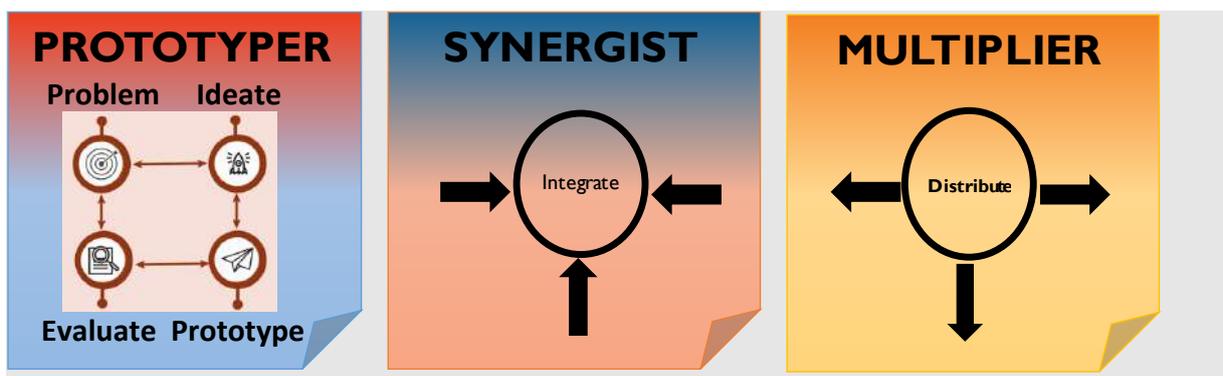

Figure 5 Cross-institutional Blueprints for European Adoption

The three mentioned blueprints are no simple representations of the universities involved in this project, but they emerged from our data analysis as part of the recommendations from the involved stakeholder and experts. They demonstrate empirically grounded archetypes of different states at which a higher education institution can locate themselves. Nevertheless, each institution should evaluate their current situation according to the following developmental questions:

- What previous experiences exist in the higher education institutions that are relevant to planning?
- How can these experiences and pre-knowledge be adapted for planning and be integrated into institutional implementation strategies?
- How can digitalisation in the organization support the implementation and adoption of new technologies?
- How can organizations adopt to the specific interdisciplinary, (inter-)national, and socio-cultural criteria at home?
- How can blueprints of such processes contribute to the sustainable higher education development?

These questions show that the implementation of a new technologies based on a didactical framework just raises awareness of other kind of relevant contexts in the different institutions.

5 CONCLUSIONS

The framework for VR implementation in formal educational contexts presented in this report results from the empirical findings based on the validation methods described in chapter 2 and experiences gained by the project partners, experts, and professionals from the field of Hospitality Management and digital education as well as other stakeholders involved in the implementation of VR development project. The findings point to the fact that there is a positive relation between the use of VR and its learning effects of presence, immersion, or collaboration. In contrast, the dimensions of economy, organization and culture are not yet sufficiently understood – reports from practical projects predominate the discussion, but validated scientific concepts are rare. With the spread of VR in formal education, the data situation will hopefully be expanded in the near future. The present framework provides a conceptual and theoretical basis to integrate experiences from VR-Education in a uniform concept and to draw conclusions and derive actions for educational institutions.

Based on the findings in this report, the project partners plan to engage in joint publications on relevant aspects of virtual collaboration and communication, open educational resources, patterns, and strategies to be recommended for the implementation into future projects. Dissemination activities will include, amongst other things, reflection on the benefits for the internationalization of universities, best practices in international, intercultural, intercultural virtual collaboration, the selection of equally accessible and inclusive digital platforms, and the development of cross-institutional partnerships between HE institutions.

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6.2 TABLES AND FIGURES