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APPLICATION OF THE METHODOLOGY OF COMMUNICATION SKILLS TRAINING FOR EMPLOYEES OF HOTEL COMPANIES, BASED ON IMMERSION INTO THE VIRTUAL WORLD

Abstract: *This paper describes a research study of communication skills training for future hotel workers in an immersive environment. The research team developed a model of the hotel reception in a virtual environment, and proposed a methodology for three-phase training. The research involved 56 testers who provided detailed feedback. To improve the communication skills of the participants, it is necessary to repeat the simulations and analyze the individual aspects of the communication in depth.*

Key words: *Communication Skills, Higher Education, Hotel Employee Training, Virtual Reality*

JEL Classification: I23

Introduction

Virtual Hotel is an application for training the communication skills of hotel staff in order to alleviate the concerns and risks associated with the spread of COVID-19. Using virtual reality, the employee puts on a head-mounted display and finds himself in a model of a virtual hotel, in which a simulation of critical communication situations based on pre-prepared scenarios takes place. In the environment, the user has the opportunity to move freely and interact with active objects, such as the telephone.

The aim of the research was:

1. to verify the suitability of the technical solution of the virtual hotel and fine-tune the model into a functional and user-friendly form, usable in the practice of hotels in the training of hotel staff and in the practice of schools in which hotel students are prepared,

2. to verify the suitability of the three-phase model of virtual training and obtain data for fine-tuning the training methodology to the optimal form

A methodology has been created for effective training, according to which lecturers and training participants will use the application. In this sense, the methodology is an irreplaceable application manual of the created model of the hotel section, processed by virtual reality technology. The methodology is based on a theoretical framework for the implementation of training in a virtual environment, including inspiration from other projects and initiatives in the field of virtual reality. Our aim was to find similar projects in the available literature that use virtual reality in education, in university education, or directly develop communicative skills using virtual reality. The methodology was created on the basis of the theoretical study of professional literature and practical experience of project implementation team members from previous projects related to virtual reality - especially from experience with training future teachers in Virtual Classroom, where it was verified in practice, and continuously improved in a three-phase training model [1].

A number of research studies have addressed the use of immersion or immersive technologies to practice communicative skills [2, 3, 4, 5, 6, 7, 8, 9, 10] and there is also a significant number of publications on using virtual reality in the hotel industry [11, 12, 13] According to Naul and Liu (2019), the basic issues addressed in this context are immersion, involvement, and motivation [2]. Dieker, Rodriguez, Lignugaris/Kraft, Hynes, and Hughes (2019) emphasize careful preparation of a virtual training scenario in studies focused on simulations

designed to train health professionals [3]. González-Martínez, Martí, and Cervera (2019) list three factors that ensure the effectiveness of simulations in a real environment: (a) realism, (b) drama, (c) challenge. By combining these factors, it is possible to create effective and learning-supporting simulations even in a virtual environment [6].

Verkuyl, Lapum, Hughes, McCulloch, Liu, Mastrilli, Romaniuk, and Betts (2018) complement work in a virtual environment with consistent feedback and 3 types of reflection: (a) self-debrief, (b) assessment by a supervisory authority (facilitator-led in-person debrief), and (c)) assessment by authorities in a virtual environment (facilitator-led virtual debrief) [4]. Dieker, et al. (2019) appeal to the cyclicality of the simulation (possibility to repeat the simulation after providing feedback). The task of the supervising person is to discuss in detail the situation with the participant [3].

Metusalem, Belenky, and DiCerbo (2017) believe that the most appropriate way to practice social communication is to play roles where participants play situations similar to those they may encounter in the real world [9]. As in the practice of public speeches, they then have their performance evaluated by an expert, and ideally also by classmates, and then they carry out a self-assessment on the basis of a video recording. According to Hazel (2011), it is especially important that the feedback is provided immediately after the performance [10].

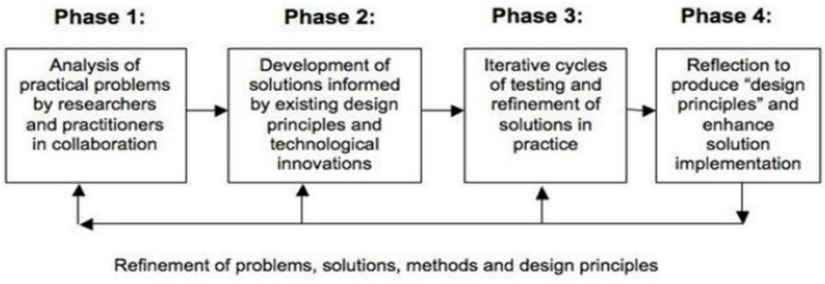
The results of research using another model of virtual hotel developped by Israel, Tscheulin, Zerres (2019) emphasized that virtual reality technology offers high usability for the potential customer. Virtual reality offers a completely new form of product visualisation which could extensively change the presentation of hotels in the future (Law, Buhalis, Cobanoglu, 2014, Guttentag, 2010). Some big hotel chains (e.g. Hilton, Marriott, Thomas Cook, Best Western) are already starting to use virtual reality for hotel presentation. However, the use of virtual reality in professional development of hotel employees is the concept quite new.

Materials and Methods

Based on the study of professional materials and previous experience, a Virtual Hotel model and a methodology of three-phase training of communication skills was created. The model was gradually improved and refined in 2021 and 2022, based on testing by research team staff, as well as feedback from testers from hospitality students and employees of co-operating hotels/experts from practice in design-based research [14, 15, 16, 17]. The research and development was also used for pilot verification and fine-tuning of the training methodology, which was tested mainly in 2022 by hotel workers and students of the hotel industry and related fields.

The design-based research consists of 4 phases [17]:

Figure 1 - Design-based research



Source: Reeves (2000)

Phase 1. Analysis of practical problems by researchers and people in practice

The proposal to create a virtual hotel and implement virtual trainings in an immersive environment was based on the practical experience of the experts of the implementation team, who for a long time encountered the

insufficient equipment of hotel students with communication skills. Theoretically focused subjects in which students reflected on general aspects of communication or traditional practical methods of practicing communication skills involving role-playing games did not have a sufficient impact. Communication skills are also proving crucial in the recruitment and training of future hotel staff, and the need to find new tools for educating new staff has been identified.

Phase 2. Development of a solution with a theoretical framework

Psychological and pedagogical knowledge of communication theory, immersive learning, and the possibilities of using virtual reality as a specific form of experiential learning and learning by doing have become the theoretical framework for the development of problem solving. Various methods and procedures were used in the actual development of the solution to the problem. These include, in particular, a detailed didactic analysis, the design of a virtual scene according to the appearance of a real hotel, the choice of controls and functionalities of the system, the compilation of scenarios, and the methodology of virtual training.

Phase 3. Evaluation and testing of solutions in practice

In particular, through action research and lively ongoing discussion with experts in pedagogy, psychology, the use of technology in technology education (with a focus on virtual reality) and the hotel industry (including hoteliers and front-office staff from practice), the suitability and effectiveness of prototypes of Virtual Hotel have gradually improved. The partial elements of the system were tested and optimized in an effort to use the most modern, and at the same time, available, technical means. In order to implement a broad cross-validation of the effectiveness of the developed solutions, various testing methods and tools were combined.

Phase 4. Documentation and reflection on the production of "design principles"

The reflection stage is an essential part of research through development, which confirms its legitimacy. At this stage, we returned to the original research problems, and discovered whether the solution created, tested, and evaluated is really the solution to these problems. The reflection was based on the data obtained in the third stage, and put into context.

Technical issues related to the project were solved mainly by experts from the Czech Technical University in Prague, didactic and psychological aspects of virtual training and the corresponding methodology was guaranteed by the team of the Faculty of Education of the University of West Bohemia in Pilsen, and the content side of the preparation of hotel students and front office staff, the staff of the University of Hospitality Management in Prague, in co-operation with experts from the Perfect Concept Hotel company, prepared a discussion with experts from practice.

The initial 3D model of the hotel reception was created using photogrammetry, and the use of Neos VR was assumed, to simplify network connectivity for connecting multiple users. However, for technical reasons, the Neos VR platform was eventually abandoned, and the Unity game engine was used for further development. The hotel reception scene itself uses Steam VR, which ensures compatibility with most currently used HMDs. The reception model also includes the entire front office part of the hotel, which improves the integrity of the experience. The created model also contains many interactive objects (e.g. computer, property management system, door keys) to increase the realism of the simulation.

A *methodology for the application of training the communication skills of hotel employees using virtual reality tools* was created for training in Virtual Hotel. This document specifies the individual phases of the training, and deals with important aspects of the development of communication skills of the target group in an immersive environment. The methodology is designed to directly correspond to the current possibilities and limits of the created Virtual Hotel model, and lead to the effective development of communicative skills of students and participants in lifelong learning in the hotel industry.

Table 1 shows the focus of the individual stages of three-phase training.

Table 1 - Three-phase training model

1.	**Initial introduction to the Virtual Hotel environment**	self-reflection discussion introduction to the implementation of the 2nd phase
2.	**Virtual training** **(immersion into a specific situation)**	self-reflection feedback discussion record analysis
3.	**Virtual training** **(repetition of a specific situation)**	self-reflection feedback discussion record analysis

In 2021, continuous testing focused mainly on the quality of immersion in the virtual environment and the technical solution of virtual resources, and in 2022, on the implementation of training according to the prepared methodology, i.e. verification of the training, involvement of individual actors, and overall solution of the training situation. The numbers of testers, their ages, genders, roles (student, hotel worker), and their previous experience of working in a hotel and with virtual reality are given in Table 3.

Table 2 - Characteristics of respondents

Total number of testers	56
Men	28
Women	28
Aged 16-25	41
Aged 26-50	11
Aged 51 and over	4
Number of student testers	39
Number of hotel staff testers	17
Previous experience working in a hotel	21
Previous experience with VR	21
Cyber sickness felt in the past	5
Cyber sickness during training	1

The same number of women as men took part in the research, and the largest group of testers consisted of students under the age of 25. A total of 21 respondents had previous experience with working in a hotel, as well as with virtual reality. Prior to training, previous experience with cyber sickness was reported by 5 test subjects, but during training it manifested itself in only one person.

Results

The following text is an overview of the feedback provided by 56 testers aged 16-59 years who tested the Virtual Hotel model at various stages of research, or participated in pilot training as trained persons (i.e. direct participants who are placed in a certain communication situation), or bystanders who provide feedback to the trainee (students, participants in further education, hotel professionals, experts in the use of technology in education, practitioners who work directly as front-office employees). On the one hand, the testers provided instant oral feedback to the research team, immediately after the training in an immersive environment, and detailed written feedback in the form of filling in printed questionnaires with open-ended questions. Their content analysis pointed out the following aspects of the application of the methodology.

In the current form of the hotel reception, a very strong immersion can be achieved; the participants of the training are surprised by the realism of the scene, and its natural feel. The feeling of the application depends to a large extent on the previous experience of testers with virtual reality. To some, the Virtual Hotel model seems technically advanced, while some expected higher image quality or application control.

Table 3 - Representative selection of answers to question Q6

Were you able to immerse yourself into the situation, or did something disturb you, making it difficult to immerse yourself in the virtual environment and the situation as a whole?
I was disturbed by my poor handling of the joystick control.
The reception should be better equipped, there could be other people in the lobby
No
Yes, I was able to get used to it without any problems
Yes, nothing disturbed me
I could not hear the opponent
I was able to immerse myself into it
Problem grasping objects
I managed it, and nothing disturbed me
Inexperience with virtual reality
Twisted figure, otherwise it was good
I was immersed in it
Nothing disturbed me
Just poor image quality, otherwise nothing.
No problem

The avatars are less natural, for which it is not yet possible to have more elaborate facial expressions and movements due to the computing power of the device. Some testers had difficulty controlling the application and individual actions during training (e.g. grabbing a document by an avatar). However, most testers got on very quickly with the environment, they completed the entire training without major problems. The quality of 3D glasses almost completely eliminates cyber sickness - only one of the tested people had to stop training due to cyber sickness. Difficulties are mainly caused by handling the motion controllers, which is not an ideal simulation of real motion. Sometimes, the difficulties are caused by the real space in which the participants

move. For the comfort of the participants, it is necessary to ensure relative quiet, so that the participants from all sides are not disturbed by the conversations of bystanders.

Within the Virtual Hotel, control is solved in an alternative way, similar to computer games, and during training it is clear that trained people must focus more on the movement and control of objects on the stage (e.g. ID card, certificate of infectivity, etc.) than would be common when using ordinary objects. Problems with grasping objects are, of course, reflected in communication, where the trained person usually has to concentrate for some time on controlling the objects using the controls, and only then resolve the communication with the client. Sometimes, it happens that the trained person shows unnecessary unnatural stress from not being able to easily manipulate objects. Sometimes, due to this, the immersion is interrupted, and the trained person begins to verbalize his failure, and therefore emerges from immersive communication. For this reason, it is appropriate that the scene be as simple as possible to control the controller - i.e. rather minimize the manipulation of objects and focus more on verbal communication.

Table 4 - Representative selection of answers to question Q7

How did you like the environment of the virtual hotel? Did your feeling approach that of the feeling when you found yourself in a real hotel?
The reception should definitely have a computer with at least a few functions
Yes, but an impersonal environment
Yes, the environment is consciously approaching the real situation
Yes, it was quite realistic
The environment is nice, but it is far from that of a real hotel
Yes, I would imagine more characters, with more noise, queues, navigation, etc.
Almost, yes
No
After a long adaptation, it would certainly come close to the feeling of a real hotel
Yes, the environment is beautiful
It needs more detail
Mega cool
I was intrigued

In the original model of Virtual Hotel, music was used, which is common in hotel receptions. However, during communication training, this music was a disruptive factor that made it difficult to concentrate, so it was decided not to use background music during training. When the music was completely turned off, some participants in the research pointed out the unnatural sound environment of the virtual hotel - music is a typical soundstage. At the reception, the noise of clients' conversations in the lobby is also very common.

When testing, the space for the movement of the trained persons needs to be large and empty enough for the persons with the head display to feel safe. It is advisable to set aside an empty classroom or a separate part of it for testing, and to place the supervisors who monitor and then evaluate the training in a separate space. However, in order to provide good feedback, the assessors need to see the trainees, either directly or on a screen. It is also appropriate that, at the same time, a projection of the image that the trained person sees in the main display is realized for any additional persons.

The three-phase training model implemented according to the above methodology is considered by trained and associated persons to be a suitable model, in which a shift in communication skills can be seen with consistent application of the model and appropriate training. If trained people have only a one-off opportunity to work with virtual reality, they often express that they were worried about controlling the avatar, sharpening the image, and other technical complications. This greatly affected their communication, on which they could not concentrate

enough. Conversely, if participants were forced to train many times in one communication situation, the training would become boring. It is therefore good to work with the use of a three-phase model, and it is possible to build on it by implementing other scenarios, which we train in two phases - we implement the first and second training. If the trained persons also participate in the training in the role of associate participants with other trained persons, it is appropriate to include different challenges for each trained person in the form of specific behaviour of individual clients (e.g. a client who speaks another language, but does not speak much, etc.). Thereby, the whole training session gains another dimension, when the training is very interesting and exciting for both the trained persons, and the people sitting in.

The testers stated that the whole training is a great experience for them, which leads them to think about communication situations, and allows them to discuss with the teacher and other participants how to behave in different communication situations. They also proactively provided a range of ideas on how to further improve the current model, and make the scene more realistic. Some topics are inspiring; some of them run into current technical possibilities.

Overall, most respondents appreciated the Virtual Hotel as an interesting idea, and as an opportunity to use virtual reality in the education of hospitality workers.

Discussion

Virtual Hotel is an opportunity to provide participants with training in specific skills and standardization of training, so that it is the same for everyone, and which the participants would not encounter in real practice. In addition, the virtual environment is also a safe environment, without the risk that misconduct will have real world consequences. [4]

Before starting the training, it is advisable to tell the participants the basic rules. Above all, it is necessary to warn the trained person to get used to the situation as much as possible, and not to try to literally "jump" out of it, out of the script. It is also necessary to emphasize to the participants so that they do not try to slip into communication clichés and make fun of the whole training, but rather to try to really get into the situation, and choose real questions, answers, and comments accordingly. Scenarios need to be prepared in detail in advance, as their realism has a great influence on the participant's role [18]. In a virtual hotel, therefore, it has its justification to work with a branched scenario proven in other previous studies [19, 20].

During the virtual reality performance, there were the evidence that positive attitude towards using technologies is crucial for the adoption of recent technologies in hospitality and tourism as mentioned also Cheng and Cho (2011) in their research.

According to Bertrand and Bouchard (2008) we found that if the user is convinced that the use of the virtual reality could lead to a positive effect, the willingness to use the application increases.

The more realistic the scene is, the better immersion the participant feel and the efect of the training is better (the same result as in the study of Buhalis and Law, 2008).

The trained people had the biggest communication problems with the use of parasitic words and unwritten expression. Some participants showed less alertness in more complicated situations or with technical problems, and conversely, some trained people are able to communicate in virtual reality with insight and a sense of humour during the first training.

For the trained persons, but also for the participants, the feedback provided by the teacher and the discussion that will develop over the individual communication situations is of great importance. It is excellent if people with direct experience in the hotel industry also take part in the training. It is only necessary to select experienced mentors for this role, who will not be too strict, so as not to discourage participants or dishonour them even in

case of “childish” mistakes. It is advisable to work with practitioners who have experience in training new staff in hotels.

It is therefore necessary to set aside enough time for virtual training and work with small groups of participants of up to 10 people. The actual immersion into the virtual environment must not take too long - the ideal time is around 5 minutes. If the training is longer - for example, around 10 minutes or more, and the trained person is not very successful in communicating smoothly without any problems, the stress of the trained person will increase greatly, which will lead to a total rejection of this type of training.

Some participants expressed concern about technology which is according to findings of

Conclusion

The pilot verification of a three-phase immersive training of communication skills for students and hotel staff in the reception environment of a virtual hotel confirmed the suitability of the chosen procedure and the usability of the model in the preparation of future front office staff. Realistic graphic design of the virtual environment helps deep immersion and high-quality 3D devices minimize the risk of cyber sickness. The current generation of university students is interested and motivated to improve their communication skills in virtual reality, and consider this option to be effective and suitable for the practical part of teaching at the university.

Teachers who have the opportunity to try training in Virtual Hotel in their teaching agree that this method has great potential for opening up a variety of practical topics of working in a hotel during teaching, for reducing the initial stress of students working at the hotel reception, and for improving students’ communication skills in specific practical situations. The view of HR and hotel staff responsible for the recruitment and training of new staff is similar. They find Virtual Hotel an interesting innovative option for preparing staff for communication within the hotel reception. Training based on communication of two living people enables maximum fluency of communication and training of prompt reaction in various standard and non-standard situations.

It is advisable to give enough space for feedback and expression to the participants of training in the virtual hotel. It is possible that they will provide feedback that will not be completely correct professionally, but even these mistakes can be used by the teacher, and they can work with them - to put everything into perspective. It is important to give space to different perspectives on the communication situation. With this type of training, it is not possible to evaluate the trained persons too strictly, as there is always a need for a large degree of empathy and helpfulness on the part of the evaluators, and an effort to provide very nice and fundamentally positive feedback.

The level of immersion is crucial for to avoid cybersickness and to better adoption of the virtual reality tool by participants of the training. User expectations are very high these days, the technical side and user-friendliness of the entire application play a significant role.

Future research work could open the questions of different communication styles, verifications of more detailed guidelines for trainers and go deep into the standards of giving feedback to trainees. And here is also the big question of the use of artificial intelligence in virtual reality training which must be developed.

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