VR in the Danish Banking sector.

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1. Introduction

The future labour market environment demands employees that can carry out the non-linear task which artificial intelligence cannot. Employers and scientist recognize that to be successful in a work environment you need more than technical abilities (Hart Research Associates, 2013) & (Jensen & Konradsen, 2017). It would be reasonable to assume that this also applies to the Danish Banking sector. Non-linear and non-technical abilities are in this study referred to as soft skills as done by Laker and Powell (Laker & Powell, 2011)

Laker and Powell show that transfer of soft-skills is low, and transfer is considerably lower than hard-skills. When learning soft-skills the trainee is more likely to be affected by prior experiences and own resistance (Laker & Powell, 2011). At the same time employers often fail to recognise the potential gains from training employees in soft-skills since these skills are less obvious and the consequences of having good soft-skills are harder to measure to employees (Laker & Powell, 2011).

Employees are generally emphasizing that communication skills are very important and that colleges should spend more time evolving these skills in college students. Communication is a vital skill when entering the modern workforce according to employers (Hart Research Associates, 2013). This need for communication found in the above-mentioned research study is also emphasized as an important skill by the cooperating bank in this research project.

Presenting is part of the communicative skill set which an employee should have when entering the modern workforce. It is key in a wide variety of task from presentation at conferences, service encounters at the workplace or in the field. Sales presentations in smaller groups etc. These different presentations are all critical to building value to a customer (Sundar, Dinsmore, Paik, & Kardes, 2016). Therefore, training and developing the skills associated to a good presentation are crucial (Hart Research Associates, 2013).

Presentation skills have been trained in classrooms throughout colleges around the world. The approach in training these skills and how much emphasise is put on the training of these skills

differs from college to college, culture to culture. It would how ever be of interest, to all who must develop their presenting skills and the work places which must facilitate this development, that this development can be done of site, when time is available to the employee and still give qualitative feedback to the employee on the presentation (Belboukhaddaoui & Ginkel, 2019). VR modules would be a cost-effective way to provide many businesses with a lifelike experience in presentations as in intercultural experiences and would be able to provide the criteria's mentioned above to make it both cost effective to the businesses and efficient to the employees (Jensen & Konradsen, 2017).

1.1 VR and presentation technique

The use of VR to create Educational virtual environments (EVE) have been developed through the last many decades (Mikropoulos & Natsis, 2011) however it is not until recent years that Head Mounted Displays (HMD's) have been affordable to a broader educational system an example is two comparable VR hardware from 204 and 2016 cost $ 45.000 and $ 1.300 respectively (Hickman & Akdere, Developing intercultural competencies through virtual reality: Internet of Things applications in education and learning, 2018). This development makes is possible to create training tools for these hard to measure soft-skills which are often neglected in training situations in many businesses. (Laker & Powell, 2011)

These above findings where the keys to start a research project within a Danish bank to investigate the employees willingness to use VR as a training tool when practising presentation techniques. This was also lead by the idea that development in a system is lead by contradictions within the system (Engström, Yrjö 2011). In this research project the contradiction was the banks continuous expectation about employee's development in presentation technique with out giving the employees proper tools to practise these techniques.

This meant creating an exploratory research project which is designed to assess if the employees are interested in VR as a training tool and at the same time to assess if the employees had a positive development in their presentation techniques when practising with HMD.

2. Theoretical Background

This section will describe two main theoretical back grounds of this study. The first part of this section will focus on the pedagogical learning theories which is the foundation of the study. Next this section will describe presentation techniques are significant to a presenter's ability to deliver a message.

2.1 Pedagogical theoretical background

The main pedagogical theory behind this exploratory research study is Vygotskijs theory on a training process. Mainly Vygotskijs idea of a person´s ability to learn as he put´s it "the activity is dialectic and complex battle between the world, the person and in the persons mind." (Lindqvist, 2006) This means that to be able to train a specific set of skills a person needs to find a purpose or goal to set at ease the internal battle. But is also means that the surrounding world has an impact on your training and therefore the training environment is important. At last, the person training is important, what are the persons believes, ideas, competences etc. because this will also affect the outcome of the training process.

Vygotskijs thoughts on the environment having an impact on learning (Lindqvist, 2006) is one of the key elements in this study. When training in with head mounted displays in a VR setting the environment becomes more realistic the environment is a smaller hindrance to learning then an environment which differs from a realistic user setting.

Since this exploratory study´s participants all are working in a bank the pedagogical theories we build upon also have to reflect this. Here an article written by Danny Wildermeersch, Veerle Stroobants and Marc Jans focuses on the employees need to find purpose in a meaningful environment constructed in a cross field between adaptation, growth, separation and resistance. (Illeris, 2020). This means that when our research participants are told by their employer that they have to participate in a research program and the purpose is that they have to learn presentation technique the 4 above mentioned elements come to play.

Adaptation because an employee often has a willingness to adapt to what the employer expects from you as an employee. How ever this becomes complex in a larger corporation where employees are meet with differing expectations. In this exploratory research project this meant that the participants where meet by the HR department with a requirement to participate but at the same time their local branch officers meet them with expectations that where of another

character. This means that the surrounding environment has a great impact on the participants willingness to learn presentation techniques.

Growth comes to play as an intrapersonal need. This is often very hard to affect since this is the individuals holistic need to feel authentic, free, and responsible. In this research project this means that the subjects have differing opinions on the value of presentation technique, and this affects the subjects willingness to practice these techniques.

Separation is the individuals need to develop an alternative individual lifestyle which can give a personal answer to the demands coming from society and this is often seen as oppressive. In this means that the demand in this exploratory research project can both viewed as oppressive by the participants because it can differ from their individual need to create a lifestyle they want or the opposite. If it is found oppressive by the participant, we expect very little training time and engagement and vice versa.

Resistance is the individual ability to critically reflect and act to affect or reshape the demands from society. This can also affect this research project since the subject´s resistance can create a desire to reshape or affect the research project.

We are expecting that these 4 elements will have an impact on the learning of the participants, and therefore these 4 elements are mentioned as key elements to why some participants want to learn presentation techniques while others are less engaging.

2.2 Theoretical background to presentation technique

Since this research project focuses on the participants ability to be better presenters there is a need for objective criteria's for measuring and assessing a positive development in presentation technique. At the same time, it is important that these objective criteria´s are validated as criteria's which will improve a presenter's ability to deliver a message.

The criteria´s selected in this exploratory study are derived from the study made by Stan Van Ginkel et. All. and described in the article "Assessing oral presentation performance". The focus in this study is to develop the presenter´s non-verbal communication skills because these skills are generic and feasible to train with HMD´s in a VR setting.

The study found that there are 3 main non-verbal presentation skills which have the highest influence on a presenter's ability to deliver a message when presenting.

The 3 non-verbal presentation skills are. (Ginkel et. All. 2017)

1. Keeping eye contact with your audience.
2. Keeping an open posture and using illustrative gestures
3. The presenters can use his/her voice to underline important notion and avoid filler sounds

These 3 non-verbal presentation skills are the performance indicators of the development in presentation skills and the interview with the participants after their presentation for the author's is the indicator in willingness to adapt VR HMD´s as a training tool in their every day work life.

3. Method

Participants

The participants in this study were given to us by the involved bank and they were told that they had to participate in the training day developed by us. The bank drives a master program for new employees that hold a master´s degree and are employed directly from university. This master program involves different course which are mandatory. Part of the master program is an introduction to presentation skills and this single day course in presentation skills was carried developed and delivered as part of this exploratory study.

The participants come from different departments in with in the bank and hold a wide variety of master degrees. All the participants a required to present as a part of their employment, for some the presentations are to co-workers and to others it is to potential enterprise customers in the bank. This means that the importance of presentation skills differs very much within the group of participants.
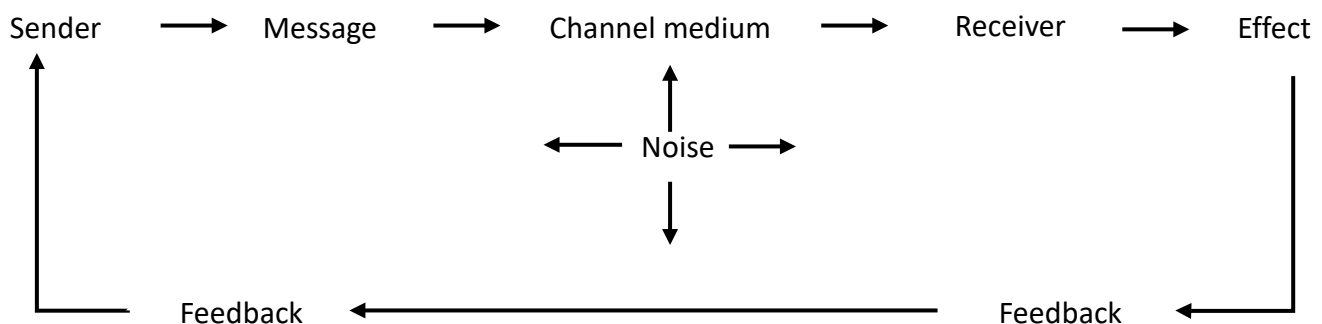
Process

To go through with this study in the collaborating bank there were different requirements from the collaborating bank. Then ban needed to be assured that the participants in this study would be thought valuable presentation techniques that would also be applicable in the bank. This meant

that the course content, structure and learning goals of the course day had to be approved by the bank before it could be applied.

When the content, structure and learning goals had been approved the course day was arranged at the college campus.

The course was divided in to segments so that the participants had to train the individual skills that are proven performance indicators on delivering a message in a presentation. The course day started with a motivation speak about the importance of the ability to deliver a message through a presentation. In this motivation part of the course the focus was on Laswell´s communication

Lasswell´s communication model (Lasswell, 1971)

Sender $\longrightarrow$ Message $\longrightarrow$ Channel medium $\longrightarrow$ Receiver $\longrightarrow$ Effect

$\longleftarrow$ Noise $\longrightarrow$

Feedback $\longleftarrow$ Feedback $\longleftarrow$

The focus of this part of the course was the importance of minimizing noise because this element has a negative impact on the receiver's ability to understand the message. In the course examples of noise were given. The examples were lack of eye contact with audience, little, negative or no use of body language and at last exaggerated use of a monotone voice and filler words (hmm, aaa, etc.)

After having focused on motivating the participants to engage in the course activities and motivating the participants to understand why it is important to be a good presenter the course focus changes. The focus non turns to understanding what a good presenter does regarding, use of voice, illustrative gestures, and eye contact. Each of these skills are then trained in different settings so the participants also get a feeling of the importance.

The main focus in the course day is to create awareness about the importance of these areas within each participant so that they feel obliged to train these skills with their HMD´s in a VR setting.

Instruments

To access if the participants have had a significant development in their skills it is necessary to record a presentation at the end of the course day. The participants are then given a set of HMD´s so that the can train their presentation skills using these and a user to a application which worked on their smartphone so that they had as little hindrance to training as possible. The training environment looked during the training period as the below pictures and they participants could freely use the setting best suiting them.

Both these VR environments are developed by the company StudyMind. This company delivers solutions for educational use at many different levels and has given this study a free of charge access to their application. The Two VR environments do not give any formal feedback to the user, the pedagogical view is self-reflection and through that development. The presentation is however recorded so that the user can listen to own presentations and see if there is eye contact during the presentation. This recording of presentations should help the users self-reflection and through that create development in the necessary skills. The application used in this exploratory research project is used on a smart phone so there is no possibility of registration of posture and gestures in the application.

They are given a minimum of 14 day´s so that they will have time to train their presentation skills. The participants where not given any direct orders by their employee on how much they should train and during the course day they were encouraged to train until they had a feeling of development within each skill. It is important to the bank that the HMD´s as a training tool has an objective effect on training and not only a felt and assumed development in skills when training with HMD´s.

After 14 days the participants were interviewed on their own feeling of progress and the presentation they gave at the end of the course day was done again and recorded.

The recorded presentations have been compared in this study and the development in eye contact, gestures and fill words are measured before and after training with HMD´s. The eye contact was measured in amount of time the presenter looks at the audience as part of the total time of the presentation. Gestures were measured in gestures pr. Minute and at last filler words are measured in filler words pr. minute.

Before the last presentation in performed by the participants they are interviewed about their experiences using HMD´s and what they would think about using HMD´s as a training tool as part of their it tools in the company.

3. Results

This exploratory study seeks to determine the possibilities of implementing HMD´s as a it tool for training in the Danish bank sector. The study only examines one bank as a case study and only the employees in this banks master program. Therefore, the study is not statistically valid to all banks in Denmark and all employee groups in the different. Banks. The assumption in this study is as mentioned before, contradictions as a source of change. The participants in this study are all meet by requirements of presentations by their employee but most of them have had non to little training. Therefore, this study on the use of HMD´s as a possible training tool in the bank was found valid.

The results from the objective measures on eye contact, use of gestures and use of filler words. Can be seen in the below schemes.

Eye contact before and after training with VR.

Participant	Training time minuttes	Eye contact presentation 1	Eye contact presentation 2	change	correlation
1	7	0,9	0,939130435	0,039130435	**0,2278098**
2	60	0,942028986	0,841772152	-0,10025683	
3	120	0,794444444	0,889285714	0,09484127	
4	15	0,12605042	0,133928571	0,007878151	
5	70	0,880434783	0,985507246	0,105072464	
6	50	0,920634921	0,989583333	0,068948413	
7	0	0,598425197	0,55	-0,0484252	
8	60	0,753623188	0,875	0,121376812	
9	10	0,670731707	0,84180791	0,171076202	
10	30	0,926380368	0,935828877	0,009448509	
11	5	0,643678161	0,814285714	0,170607553	
12	60	0,716666667	0,784615385	0,067948718	
13	5	0,325396825	0,320895522	-0,0045013	
14	10	0,661290323	0,760683761	0,099393438	
15	90	0,804054054	0,929824561	0,125770507	
16	120	0,577319588	0,81938326	0,242063672	
17	120	0,930875576	0,913907285	-0,01696829	
18	40	0,941176471	0,893129771	-0,0480467	

The above table shows the number of participants and for how each participant practiced with HMD`s in the VR setting. The column eye contact in presentation 1 shows percentage of time the participant held eye contact with the audience in the first presentation, which is before training. The column eye contact presentation 2 shows the percentage of eye contact in presentation 2, which is after training with HMD´s in a VR setting. The change from the first to the second

presentation is seen in the column "change". The column correlation looks upon the correlation between improvement in eye contact from first to second presentation and training time with VR. This shows that there is a positive correlation between the amount of time the participants train with the VR application and their ability to keep eye contact with the audience.

Filler words before and after training with VR

Participant	Training time minuttes	Filler words 1	Filler words 2	Change	correlation
1	7	0,133333	0,034783	-0,09855	**-0,02691**
2	60	0,036232	0,018987	-0,01724	
3	120	0,1	0,014286	-0,08571	
4	15	0,016807	0	-0,01681	
5	70	0,108696	0,057971	-0,05072	
6	50	0,063492	0,03125	-0,03224	
7	0	0,141732	0,1	-0,04173	
8	60	0,217391	0,1125	-0,10489	
9	10	0,152439	0,146893	-0,00555	
10	30	0,01227	0,026738	0,014468	
11	5	0,005747	0,035714	0,029967	
12	60	0,016667	0	-0,01667	
13	5	0,095238	0,067164	-0,02807	
14	10	0,177419	0,08547	-0,09195	
15	90	0,162162	0,163743	0,001581	
16	120	0,097938	0,052863	-0,04507	
17	120	0,096774	0,112583	0,015809	
18	40	0,098039	0,091603	-0,00644	

The above table shows the number of participants and for how each participant practiced with HMD`s. The next column shows how many fill words there are pr. Second in the first presentation. The column filler words 2 show how many fill words there are pr. Second after training with

HMD´s in the VR environment. The column change shows the improvement in minimizing fill words from presentation 1 to presentation 2. The column correlation looks upon the correlation between improvement in minimizing fill words from first to second presentation and training time with VR. This shows that there is no correlation between the amount of time the participants train with the VR application and their ability to minimize fill words in their presentation.

Gestures before and after training with VR

Participant	Training time minuttes	Gestures 1	Gestures 2	Change	**correlation**
1	7	0,416667	0,321739	-0,09493	**-0,254186075**
2	60	0,347826	0,322785	-0,02504	
3	120	0,316667	0,296429	-0,02024	
4	15	0,378151	0,321429	-0,05672	
5	70	0,086957	0,101449	0,014493	
6	50	0,333333	0,375	0,041667	
7	0	0,401575	0,457143	0,055568	
8	60	0,471014	0,46875	-0,00226	
9	10	0,170732	0,310734	0,140003	
10	30	0,331288	0,272727	-0,05856	
11	5	0,143678	0,292857	0,149179	
12	60	0,516667	0,461538	-0,05513	
13	5	0,126984	0,208955	0,081971	
14	10	0,233871	0,316239	0,082368	
15	90	0,182432	0,239766	0,057334	
16	120	0,072165	0,145374	0,07321	
17	120	0,400922	0,337748	-0,06317	
18	40	0,248366	0,229008	-0,01936	

 The above table shows the number of participants and for how each participant practiced with HMD`s. The next column shows how many gestures there are pr. second in the first presentation. The column filler words 2 show how many gestures there are pr. second after training with HMD´s in the VR environment. The column change shows the improvement in using gestures from presentation 1 to presentation 2. The column correlation looks upon the correlation between improvement in using gestures from first to second presentation and training time with VR. This

shows that there is a negative correlation between the amount of time the participants train with the VR application and their ability to use gestures in their presentation.

Interviews

All the participants in project were interviewed after the last presentation. The interviews were structured so all participants were given the same questions, but all questions were open ended so the participants had the opportunity to tell their personnel experience. This is important because bringing about change in an organisation is according to Yrjö Engström (Engström, Yrjö 2011) is very much the employees feeling of contradictions in the system. These interviews were then conducted to fid out if the participants had a feeling of contradiction in the system and if they could see the solution being HMD´s and a VR setting.

The most important quotas are listed below from the interviews.

First there are the positive quotas, where participants in this project are positive about VR and trying to see solutions to how this could work.

"It is easier to say it out loud… it feels more natural to say it out loud when I have the glasses on"

"It is an advantage that you are in this closed world, you will not get disrupted in you training when you are in this little world"

"I think the effect will be better on presentations that you have to hold in front of a lot of people and not just a little meeting. It would be nice if it was possible to see you hands and would be able to work around in the room like the real world."

"Technically you would get much more out of it if you could see you own hands and move around"

"Yes I think it could be of use if I had the feeling that it was reel."

The above quotas present 6 different participants comments on the possibilities for using VR to practice presentation. These 6 participants all had a very positive approach which is also seen in these quotas. These focused on the positive sides and how this could be a good IT-tool in their everyday work.

The next quotas that are presented are less positive towards VR as a training tool.

"I feelt nausies after using the VR HMD´s"

"It was hard to make it work"

"The time I spend on making it work I could have spend practicing my presentation"

"It has to be reel people"

"I feelt like participating in a sims game"

"There were a lot of technical frustrations"

"it did not work with my glasses"

"I could not see my self"

"I could not see my hands"

In general, there where 6 participants out of the 18 who found that VR was a tool they could use in their job in the bank. Some of the 6 participants said that the VR environment had to be modified and needed more features, but they were positive about VR as an IT tool for training VR.

But 12 out of 18 participants were not very positive. Either they could not see that VR ever became a viable IT tool for the banking sector. Others were less negative about VR in general, but they would not use it in their current job situation in the bank.

The findings in this exploratory research project are that by training with this VR setting the trainee can effectively become better at looking at the audience. On the other hand when practicing, the trainee will according to the results become worse at using gestures and there will be no effect on avoidance of filler words. 1/3 of the participants are positive about VR as a training tool in their current job position all though some of these participants also found that there is a need for further development of the VR environment. This research project will conclude that for

VR to become a good training tool on presentation technique it is important that there is further development.

The future of VR

Since this research project finds that the use of VR in Danish banks as a training tool is premature, the scientist seem obligated to recommend developments that might mature the technology so that it will become a viable training tool for the Danish banking sector.

The actual environment needs to be more realistic, the participants where all very aware of the realism of the environment. The participants all wanted a more realistic setting for their training, this meant that in the scenario where the stood in front of a class they wanted the class to be real people. For the most the participants preferred the non-interactive setting to be set at a stage with hundreds of listeners in eyesight and they should be real people.

The environment where the where 2 people listening to the presentation and asking questions during the presentation the participants had other development suggestions. The avatars in the environment had to ask questions which made sense concerning the topic which was presented.

The participants would generally preferred, a better feedback system in the environment. Some participants suggested that there could be an alarm when the trainee used to many filler words, did not look at the audience or forgot to use gestures. Such a reminder might be a very good training tool so that the trainee will become aware of short comings and be able to adapt during practice.

The problem with practicing the use gestures in this environment is built into the problem with using a smartphone as the training device. There are currently no smartphones with hand tracking devices built in so this makes it impossible to practice gestures effectively using a smartphone as your VR device. There are other devices where hand tracking is a part of the device and further research should be done to fin out if this would make it a better solution when practicing gestures which would also make it a better tool in general.

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