Well begun is half done: How to enhance learning experience in virtual training environment

Marjut Mäkinen

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Abstract

Author
Marjut Mäkinen

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When Covid-19 pandemic started, it caused significant, sudden changes in the operating environment of Aviation industry. In addition to the massive reduction of passenger traffic, the training courses for the personnel had to be transferred to online on a fast schedule. There was no time to consider more in detail, how they should be organised.

This thesis was commissioned by Aviation Quality Services. The thesis was studying, how the virtual training courses are currently conducted, and how they could be improved. The focus was on the learning experience in virtual environment.

The theoretical framework of the thesis covered the aspects of learning in virtual environment. The common pedagogical principles, as well as the roles of the trainer and participants were considered. As the technology is a very big part of the virtual environment, the theory was also covering the knowledge of utilising technology in pedagogical purposes.

This thesis was qualitative by nature, and it followed the case study approach. The used data collection methods were participant observation, expert interviews, and archival records. The analysis of the thesis was done by pattern matching, and cross-case synthesis techniques.

There were five key findings raised. First finding was, that virtual training and on-site training require partly a different approach. Another finding was related to trainer: The role of the trainer is more versatile and demanding in virtual trainings. Third finding was that the usage of technology is not uniform or very fluent. Fourth finding was stating that interactivity involving all parties is the key for successful training. Last finding was, that the meaning of time is significantly different in virtual environment.

The conclusion of the thesis was that virtual environment requires special considerations, as the pedagogical principles must be implemented in the training by utilising technical tools. Therefore, the training courses must be designed very in detail.

As an outcome of the thesis, suggestions for further development of virtual trainings in Aviation Quality Services was given. In addition, a video was created to give the basic guidelines for conducting virtual trainings.

Keywords
Training, Virtual environment, Pedagogy, Learning, Technology

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1 Introduction

When covid-19 pandemic started in 2019, it surprised all. Nobody could imagine beforehand, how much the world would change in a very little time what comes to digitalisation and digital transformation. For sure, many companies had planned and even conducted some operations related to digitalisation. But it all happened so fast, that many companies lacked the time for a proper preparation.

The need for this thesis arose also due to Covid-19 pandemic, which caused significant changes to the operating environment of Aviation industry. In addition to the massive reduction of passenger traffic, many other operations needed to be reorganised. One example of these operations is the training courses for the personnel. These trainings had to be transferred to online on a fast schedule. There was no time to consider more in detail, how they should be conducted.

Now that the pandemic is beginning to subside, it is good to look at what has been learned from the virtual trainings. It is time to study, how the learning experience could be improved, and what technical aspects should be considered when organising virtual trainings. These issues are examined in this thesis.

1.1 Aviation Quality Services

This thesis is commissioned by **Aviation Quality Services**, later AQS. In this chapter the AQS is briefly introduced. As the thesis is focusing more on the training courses AQS is providing, the concept of the trainings is also described.

Aviation Quality Services is founded in 2001 and it is a full-service provider of safety and quality management solutions in the aviation industry by conducting audits and providing various training courses. AQS is economically fully independent company, but it is a 100% subsidiary of Lufthansa Aviation Training which gives it the financial backing of Europe’s largest airline group. Headquarters is based in Frankfurt am Main, Germany, but their services are provided world-wide. (Aviation Quality Services 2022a.)

AQS is providing various training courses related to safety and quality in aviation industry. The trainers in AQS are working as freelancers and are regularly working with AQS. According to Aviation Quality Services (2022b) the training courses are providing both theoretical background and the practical tools needed to be proficient in Quality, Safety and Compliance management. The trainers in AQS have a solid academic background and many years of practical experience in the subjects they teach. Many participants in AQS's training courses are working in high level positions in different airlines so it is also the opportunity to learn a lot from others.

1.2 The structure of the thesis

The structure of the thesis follows the general instructions of Haaga-Helia University of Applied Sciences. Thesis chapters and their content is presented in table 1. The thesis follows a consistent line and includes seven chapters. After the introduction, it starts from defining the objectives and expected outcomes including research questions. Chapter three contains the theoretical frame, related to learning and virtual environment. Chapters four and five are explaining the methodological frame and the methodological choices as well as data analysis used in the thesis. Sixth chapter is revealing the results and comparing them to theory. The outcomes, and evaluation from different perspectives are described in the last chapter of the thesis.

Table 1. Thesis chapters and their content

CHAPTER 1	Introduction	Commissioning company
CHAPTER 2	Objectives and expected outcomes	Research questions
CHAPTER 3	Theoretical framework	Learning in virtual environment Roles of the trainer and participant Technology
CHAPTER 4	Methodological framework	Qualitative research Case study
CHAPTER 5	Material and methods	Data collecting methods Data analysis
CHAPTER 6	Results	Key findings Discussion of the findings Analytical generalisation
CHAPTER 7	Reflection and further considerations	Conclusions Outcomes Evaluation

2 Objectives

One of the most difficult things to change is our mindset on certain things. New and unfamiliar things can be scary. For example, online learning might be out of the comfort zone. When online learning originated as another alternative to traditional learning, many were sceptical and could not understand how learning could occur outside a physical classroom. As we have seen with Covid-19 pandemic, the things once considered normal in all areas of our lives do not exist anymore. Everything has changed and we must adapt. (Sims 2021, chapter 3.) At this point, it is quite clear that the virtual trainings have come to stay at least in some form. Therefore, it is critical to study how they should be implemented in a best possible way. One objective of this thesis is to find out, what AQS should consider when conducting virtual trainings.

Many businesses lack the skills, knowledge, or insight to get the most out of the digital opportunities. The covid-19 pandemic accelerated the shift to working in virtual environments. The sudden need to adapt working practises to virtual space means, that there has been a steep learning curve, and many companies find it difficult to realise the full potential of their virtual sessions. (Anders, Nelson & Ronex 2021, 2–3.) Another thesis objective is to find out, how the virtual training courses are currently conducted in AQS, and thus examine if their full potential is in use. The aim is to make the available digital opportunities visible and thus improve the learning experience in training courses.

There are many arguments in favour of virtual trainings, what makes it pivotal to develop them. Not only because of Covid-19 pandemic but also to offer better options for various learning experience and thus value for customers. For example, according to Andersen, Nelson and Ronex (2021, 35) the benefit of virtual training is that everyone is more equal in a virtual environment, and it is therefore easier to engage everyone and get more uniform contribution from every participant. Määttä (2019, 10) also agrees that the virtual learning environment enables more equal participation for those, who in formal classroom discussion tend to stay more aside.

Simply put, the main objective of the thesis is to find out how the virtual training courses are currently conducted in AQS, and how they could be improved in terms of better learning experience. The next chapter describes the expected outcomes of the thesis more in detail.

2.1 Expected outcomes

When talking about developing virtual training courses, there are different stakeholders to consider. Of course, the most important stakeholders are the customers (training participants). Second stakeholder to consider are the partners (freelancer trainers). And of course, the perspective of the

company itself should be considered as well. The outcome of the thesis looks different depending on the stakeholder. The outcomes of the thesis for different stakeholders are:

- AQS is aware of the benefits and opportunities from online training course implementation and can further develop them alongside with on-site trainings
- The trainers know how to conduct the online training course as effectively as possible and how to utilize the digital tools in online implementation
- The customers attending to training courses are ensured to have a good learning experience in the future whether they decide to enrol to on-site or virtual training

As described above, different stakeholders benefit from the thesis in different ways. For the trainers, the benefits are more concrete than for AQS. The customers will benefit from the thesis indirectly. The levels of the concrete benefits are described in figure 1.

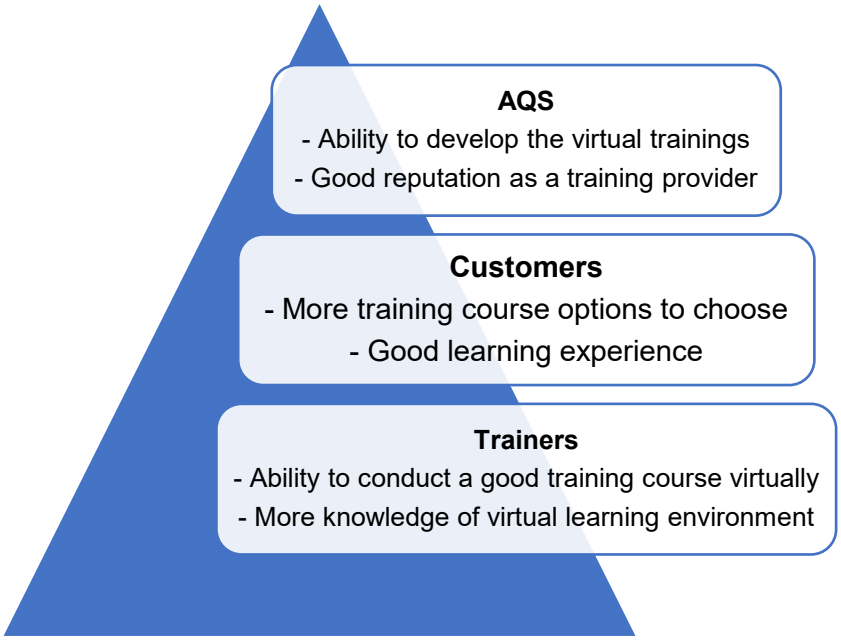

Figure 1. The levels of concrete benefits from the perspective of different stakeholders

One outcome of the thesis is a guidance video of good practices to conduct an online training course, considering digital opportunities. This helps the trainers to plan and conduct the training courses virtually as effectively as possible. Another outcome is to provide a detailed development plan for AQS to be more confident in planning and conducting the virtual implementations in the future. Hence, AQS can offer virtual training courses with a best possible learning experience as part of the training portfolio in the future.

2.2 Research questions and the scope of the thesis

To achieve the thesis objectives, there are four different research questions to clarify. For giving recommendations related to development, the current state of the trainings must be studied. It is also important to know, what challenges, and what technical opportunities there are when conducting virtual training courses. The last thing is to find out, how the virtual training environment could best support the participant's learning experience.

The research questions are:

- How virtual training courses are currently conducted in AQS?
- What kind of challenges applies when conducting trainings virtually?
- What kind of digital opportunities can be utilised in virtual training courses?
- How the learning experience could be improved in virtual trainings?

Improving virtual training courses is a very wide topic, and it contains many different aspects such as customer's learning experience, learning goals, digital opportunities, facilitation, financial profitability, regulations, content of the training material and considering hybrid implementation. It is important to select the specific issues and themes what this thesis is about to study.

This thesis is focusing on how the virtual training courses should be conducted in AQS, and what facilitation requirements there are from trainer's perspective. The focus is mainly on learning experience, in which the customers play a significant role. However, the thesis is not a co-creation process for how the training courses should be conducted from customers point of view. There are two reasons for that; in Aviation industry there are many regulations which applies also to training courses. That means not everything can be designed only in collaboration with customers but more regarding to the requirements. The other thing is, that the nature of the customers' attendance to training courses is irregular, which would make it very difficult to make a thesis-process-long cooperation with them.

The content of the training material as well as regulations-related matters are excluded from the thesis. The reason is, that these themes require vast substance knowledge from Aviation and these matters cannot be affected by the thesis. The financial profitability is also excluded from this thesis. How the virtual training courses should be organised in the future from financial perspective, is an issue that is up to AQS and its strategical planning. Hybrid training is excluded from the thesis as well. Hybrid session is an event, where everyone is connected via virtual platform, but some participants are physically together in the same room while others are physically apart (Andersen & al. 2021, 264). AQS is not conducting hybrid trainings currently. Hybrid implementation also requires many additional aspects related to learning experience.

The scope of the thesis is illustrated in figure 2. The themes to which the thesis is focusing are marked under the green plus. The themes excluded from the thesis are marked under the red minus (figure 2).

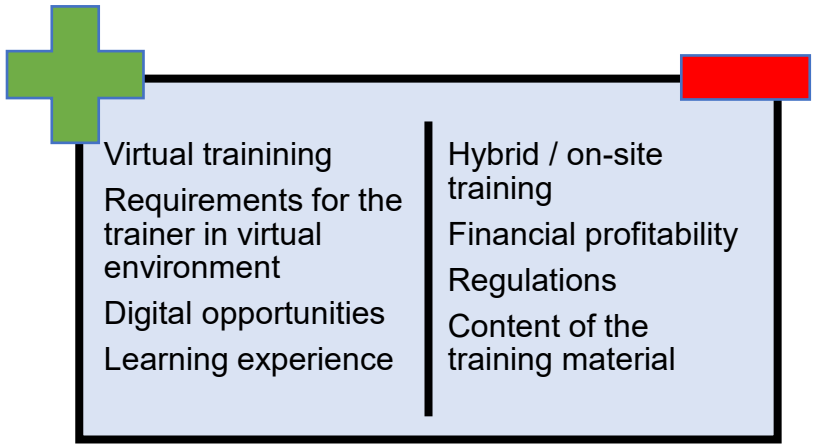

Figure 2. The scope and delimitation of the thesis

3 Learning in virtual environment

This thesis is focusing on virtual trainings and learning experience in virtual environment. There is no single, unified theory of what is learning, but rather several different definitions (Wheeler 2019, 9). Therefore, it is appropriate to clarify, from what perspective learning is studied in this thesis.

The focus of this thesis is in five different pedagogical principles. These principles should be considered in virtual trainings to ensure the best possible learning experience. The pedagogical principles are based on theoretical traditions of learning. These theoretical traditions, and pedagogical principles are presented in this chapter.

Virtual training environment creates different learning experience than a normal classroom. Therefore, it is relevant to also look at the concept of virtual training and the different considerations what comes to the roles of the trainer and participants as well as the technical aspects. Later this chapter, the virtual training is defined, the different roles are described, and the technical aspects are examined in context of learning.

3.1 Three traditions of learning theories

There are three commonly known traditions of learning theories: associative, cognitive, and situative. These three theoretical traditions, offer a set of complementary ideas which refer to broad the pedagogical principles (Mayer 2020, 17). This thesis is focusing on these pedagogical principles. Therefore, the three traditions of learning theories are also briefly presented in this chapter.

The first tradition is **associative** perspective. Associative learning is a form of conditioning, which is a theory that states that behaviour can be learned or modified based on a stimulus or a response (Spanella & Chapel 2021). The stimulus that works as positive or negative feedback are called reinforces. Classical and instrumental conditioning are a part of associative behaviouristic learning, as the learning is based on that the learner creates connections between two previously unconnected stimuli, or their own spontaneous acts as a reinforcement of an action (Lappi and Brattico 2008, 5.)

Associative learning highlights linking the elementary units and building of these elementary units into more complex pattern through activity and feedback. Applying associative learning in education, a method known as programmed instruction highlights the reinforcing of small steps of learning through immediate knowledge of results. (Mayer 2020, 18). Associative learning states that ideas and experiences reinforce each other and can be linked to one another mentally. This means our brains were not designed to recall information in isolation but rather by grouping information together into one associative memory (Spanella & Chapel 2021.)

The second tradition is **cognitive** perspective. In this perspective, the focus is on understanding in more detail the nature of internal representation. Learning itself is viewed more as an active problem solving. In pedagogical terms, learners' key challenge is to build the framework of understanding and learning is a by-product of understanding (Mayer 2020, 19.) In this theory, a learner is looking at thinking and mental processes, and how cognitive thinking can be influenced by external and internal factors. Cognitive learning theory can be divided to social cognitive theory and cognitive behavioural theory. Social cognitive theory emphasizes learning happening in social context and being impacted by the person, environment, and behaviour. In the cognitive behavioural theory, our thoughts determine our feelings and behaviour. (Western Governors University 2020a.)

From cognitive perspective, the main emerged pedagogical approach is constructivism, which's key aim is to create a situation in which a learner will have to expend effort in reflection and self-explanation (Mayer 2020, 19). Constructivism assimilates most of the cognitive-based theories, such as social learning and information processing. Constructivism focuses on the uniqueness of learners because people are very dynamic in nature; their values and views change over time, and these changes impacts future knowledge. (Hammad, Khan, Safieddine & Ahmed 2020, 344.) Kara (2019, 20) also states, that constructivism requires individualised learning. The idea of constructivism is, that to acquire knowledge, the learner should associate the given information with a real situation. One of the key methods of this approach is problem solving.

The main idea in constructivism is that people actively construct or make their own knowledge, and that reality is determined by learners' experiences. The learners use their previous knowledge as a foundation and build on it with the new information they learn. (Western Governors University 2020b.) It is a fact, that using the constructivist approach is very effective in terms of cognitive process, and self-learning based on experience. However, a perfect learning method does not exist, and therefore in this, like in the other approaches, are also a few disadvantages such as difficulty of preparing a constructivist lesson, the complexity of the design, and lack of expert constructivist teacher. However, constructivism is the most dominant approach to education in this century, and it has affected deeply in teaching and learning processes in recent years. (Kara 2019, 20–21.)

Third tradition is a **situative** perspective, in which the simple idea is that an individual learns through the influence of other people. Further studies emphasize the importance of the learning group, in which collaboration can create outcomes that exceed that achieved by individual learners by themselves. (Mayer 2020, 19–20.) Situational learning emphasizes the relationships and interactions with others to build understanding. Learning is heavily related to collaborative activities, where every learner brings their own previous knowledge to the situation and challenges the thinking of others. All activities are related to real-life situations. (Kurt 2021.)

Virtual learning models can be situative, if the acquired meaning and knowledge are personally and socially constructed through interpersonal participation within communities. For example, by creating, sharing, and reflecting, interpersonal relationships and social participation. However, learning theories can only explain how different learners learn, but they do not tell them how to learn. Therefore, it might be helpful to utilise pedagogy to design a process that guides learners to learn effectively. (Hammad & al. 2022, 352.)

Three traditions of learning theories have been presented above. The key points related to these theories are described in figure 3. The focus of this thesis is on the pedagogical principles, to which these three traditions give the basis. These principles are presented in the next chapter.

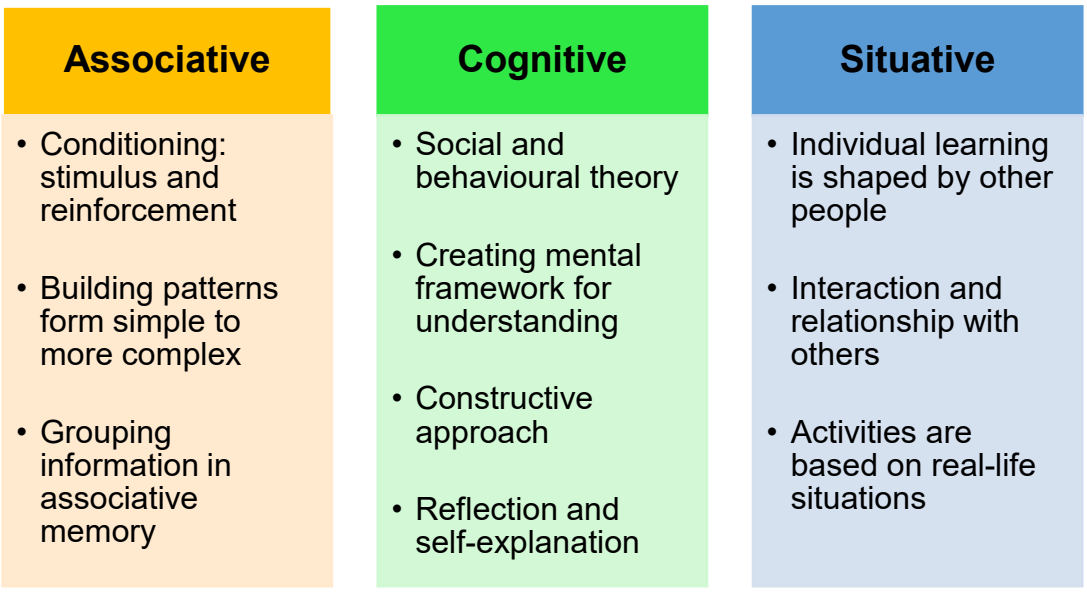

Figure 3. Traditions of learning theories (adapted from Mayer 2020, Spanella & Chapel 2021, Beetham 2020)

3.2 Pedagogical principles studied in this thesis

Research shows that educational experiences that are engaging, active, contextual, social, and student-owned lead to deeper learning (Cornell University 2022). This thesis is focusing on five common pedagogical principles. These principles are engagement, interaction, feedback, activity, and contextuality. This chapter justifies the reason for raising these five principles under study.

The first pedagogical principle studied in this thesis is **engagement**. Associative, constructive and situative theoretical traditions of learning, are all highlighting the need of a learner to be engaged in their own learning (Beetham 2020, 32). Many sources stress the importance of engagement what comes to learning, and its importance is especially emphasized in virtual trainings. The trainer

must be able to provide collaborative and creative ways to learn, as participants are not engaged online if the trainer dominates the session (LaBorie 2021, 16).

Learner engagement is a measure of potentially successful learning experience for every parties. Engagement reflects the quality and quantity of a learner's participation in the course and every other aspect of his/her educational program. It also reflects the learner's interaction and cooperation with the instructor and co-learners. (TalentLMS 2018, 6.) Few things will change without engagement. Engagement is crucial and it is the key element to the process of facilitation. In terms of facilitating virtual instructor-led training, it is vital to ensure that the focus is on engagement with the participants. (Andersen & al. 2021, 171, 286.)

The second principle is **interaction**. Interaction between the trainer and participants as well as among participants is an important aspect of learning. It enables participants exposure to and an increase in understanding of various perspectives (Cornell University 2022). Learning is always a social activity, which means that interactions with others prompt reflection and therefore the development of knowledge (Kurt 2021).

The virtual trainings under study, are aimed at aviation professionals who come from various backgrounds. As mentioned before, in addition to learn the course content, the idea of the training courses is to share experience and thus learn from each other. Hence, the interaction is an important element in learning experience. The form of learning commons is a learning principle which has never been outdated, rather it has been reinforced in today's age of hyperconnected technologies (Wheeler 2019, 109).

The third pedagogical principle of the thesis is **feedback.** Associative, cognitive and situative learning theories suggest different kinds of feedback, but all theories agree that feedback to learners, and adaptation in response to learners is critical part of effective learning process (Beetham 2020, 33). Feedback is also important when learning professional skills. The training courses under study are aimed precisely for aviation professionals. According to Ellaway (2020, 202) giving and receiving feedback is pivotal to teaching professional skills because learners need to know what they are doing right and wrong and how to improve their performance.

It is important to close down any incorrect learnings and get feedback from the participants and check in with what they have learned. This also allows participants to reflect with their own learning. (Andersen & al. 2021, 294.) It is important for learning experience, that participants are giving feedback to the trainer and that the trainer gives feedback to the participants. Feedback what trainers give to participants is a key aspect of the training, as it helps learners develop a deeper understanding of the content and the behaviours that they are practising (Orey 2021, chapter 6).

Another aspect of feedback is that participants give feedback to each other. Both self-assessment and peer-assessment are good ways to evaluate each participant's own and others' contributions, and educational researchers have found that through peer instruction participants can teach each other by addressing misunderstandings and clarifying misconceptions. (Cornell University 2022). This aspect of peer-feedback is strongly related to the principle of interaction which was presented above.

The fourth principle is **activity**. It is important to learn things not only in theory but in practice as well. Increasing knowledge is an essential part of professional education, but more than knowledge, professionals need to be able to apply their knowledge in practice (Ellaway 2020, 201). Many resources stress the importance of activation in learning process. According to Beetham (2020, 32) after decades of educational research, it can be said that what leads to developmental change is the engaged activity. Therefore, the course must be designed around activities that learners are motivated to engage with, and that are constructively aligned with the overall intentions or goals for their learning.

People need to be active in their own learning process because learning is about creating connections in the brain. People need to try out what they learn, and that is the most important thing. It is not enough to see someone else's shared slides or to see someone else's demonstration of the desired skills. People need to hear themselves saying these things, and they need to work on the activities themselves (Anderson & al. 2021, 287.) Enabling activity is therefore pivotal also in virtual training courses.

The last pedagogical principle in this thesis is **contextuality**. It is important that activities and practices can be related to some real-life context. There are different ways to do it, but it is necessary for the learning process. The three different learning theories emphasize the need for integration and consolidation across different activities, whether associatively, constructively, or situatively (Beetham 2020, 33).

Learning cannot happen in isolation; it needs to be contextual. From learning perspective, it is important that the activities are relevant and part of participants' everyday work. As a trainer, it is not possible to take one process and replicate it for lots of different groups. (Anderson & al. 287.) Ideally, the learners are engaged in real-world problem solving in an area that interests them (Kurt 2021).

The five presented principles are relevant in learning processes regardless of the learning environment. This thesis is focusing on virtual learning environment and how these principles apply virtually. In the next chapter, the concept of virtual training is defined, roles of the trainer and

participants are clarified, and the technical considerations are discussed from the perspective of these five principles of learning.

3.3 Virtual training

There are different kinds of virtual sessions, and it is important to understand the differences between a meeting, a workshop, and a training session (Andersen & al. 2021, 17). This thesis is focusing on the concept of virtual training. The concept is defined more in detail below.

There are several titles for virtual training, such as online learning, E-learning, and web-based learning. For example, according to Petretto & al (2021), there is still an open debate about the correct definition of E-learning. What is agreed is, that E-learning as a concept covers a wide range of applications, learning methods, processes, and tools.

Dhawan (2020, 5) uses the term online learning. He defines online learning as a learning experience in synchronous, or a-synchronous environments using different devices with internet access. AQS offers distance learning solutions with a virtual training portfolio (Aviation Quality Services 2021). As the thesis is focused on AQS, the concept of virtual training is used.

Virtual training refers to training conducted in a virtual or simulated environment, or when the trainer and the trainees are in separated locations. Virtual training and virtual training environments are designed to simulate the traditional classroom or learning experience. (Training industry 2021.) Virtual training can be conducted synchronously or asynchronously. Social learning plays a big part in a trainer-led synchronous training, when asynchronous training is non-trainer led, with the trainees going through content at their own pace and receiving less support (Andersen & al. 2021, 286.)

Dhawan (2020, 7) agrees that in the synchronous learning environment participants attend live lectures, there are real-time interactions between trainer and participants, and there is a possibility of instant feedback. It is confirmed by Gross, Ling, Richardson, and Quan (2022, 1) that a synchronous virtual distance learning enables real-time interactive communication with the participants.

This thesis is focusing precisely on synchronous trainer-led virtual training. Therefore, the roles of the trainer and participants are important in terms of social learning. These roles are discussed in the next chapter.

3.3.1 The roles of the trainer and participants

AQS is providing training courses with very knowledgeable trainers, and the participant in the training courses are usually very well experienced, as stated earlier. Therefore, it is relevant to look at

these different roles in a theoretical context as well. The different roles of the trainer and the importance of the roles of the training participants are clarified in this chapter.

AQS is using the term **trainer** and therefore, this is the main term used in this thesis. However, there are different definitions for the person who is the instructor of the training course. Especially when talking about virtual trainings, many sources use the term facilitator.

The word facilitation comes from the Latin word: facilis. It means to make something easier or to move freely. So, facilitation can be described of something to make things easier and free flowing. It can also be described as the process of channelling the energy and communication of a group working on a particular matter to deliver a better outcome than if they were working on their own. Facilitator is the person doing the facilitation. (Andersen & al. 2021, 13.) Cleveland-Innes (2020, 99) is emphasizing that the need for facilitation is much more vital in online environment than in the face-to-face environment, where habits are well established, and many communicative functions are fulfilled by paralinguistic cues.

When facilitating a virtual training, the trainer must consider many things simultaneously. The trainer is responsible of taking the lead on the learning content, the participant's connection to it, and ideally how the participants make meaning and apply it to their real-world environments (LaBorie 2021, 15). Andersen, Nelson and Ronex (2021, 20) confirm that the instructor of the training decides, how interactive the training will be. Sharing information and letting people work with it themselves, using breakout rooms and tasks, and connecting information to participants' own world are some of the key areas when conducting the virtual training.

Existing literature shows that virtual learning can be as effective as on-site learning. However, the sudden changes to the presentation style, instruction quality participant preparation, content modifications or materials due to pandemic may cause effect that it is currently not as effective. For example, it may reduce the efficiency, if the trainer is receiving the instructions provided only focused on the platform, and not comprehensive information of how to teach virtually, and how to adapt on-site instruction to virtual instruction. (Gross & al. 2022.)

As described above, there are many different aspects to consider as a trainer in virtual learning environment. According to LaBorie (2021, 14), it would be good, that the trainer takes care of the content and the meaning of the training, while some other person takes care of the logistics and technology: the training content should be separated from the technology. Andersen, Nelson and Ronex (2021, 50 – 51) are also recommending, that especially in larger virtual sessions would be a technical assistant, who is responsible of setting up the room for the trainer, helping participants

with technical issues and setting up the micro-involvements and exercises. The different roles during the training course are illustrated in figure 4.

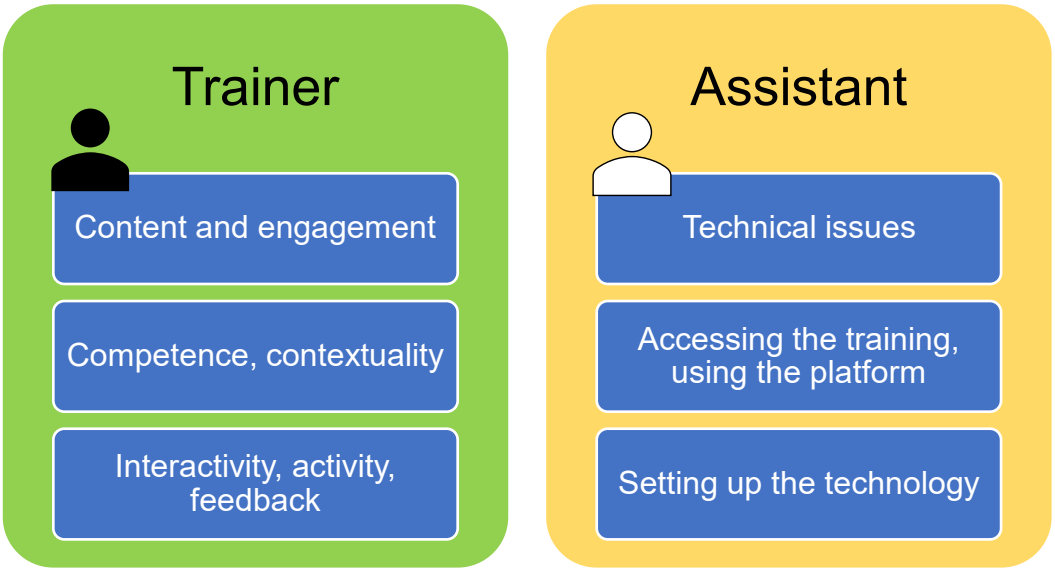

Figure 4. The roles of the trainer and technical assistant (adapted from Andersen & al. 2021 and LaBorie 2021)

It is not possible always to have technical assistant or co-facilitator, and in these cases the trainer must take care all the previously mentioned things alone. Thus, proper preparation is essential especially in these cases. According to Orey (2021, chapter 1) all facilitation sessions require preparation, but the success of a virtual session is even more dependent on how carefully it is prepared. To be able to provide smooth and effective training delivery, the trainer must be well prepared with the material and technology.

Above has been described the different considerations what comes to the role of the trainer in virtual trainings. It can be concluded that the trainer's role in virtual training is very demanding compared to face-to-face training, especially if the trainer must be alone in the training situation. On the other hand, the participants also have an important role during the training. This role is clarified below.

As noted earlier, AQS training courses have usually very experienced participants, which has a significant impact on the overall learning experience. Peterson-More (2021) reminds that learning is a two-way street and therefore it is important for the participants to prepare well to the training session. The participants need to study the possible pre-material, select a silent environment to be able to focus and to respect other participants, follow the agreed ground rules, and give feedback to the trainer and each other.

The virtual environment is new and challenging for the trainer, but also for the participants. Technical difficulties, internet stability, and a less-controlled environment for example when participating to the training from home, make it more difficult for people to concentrate. (Gross & al. 2022.) Studies show that people are behaving differently in virtual session than in face-to-face session. For example, people are carrying out other work-related tasks, sending emails, looking at social media, or even cooking or shopping online. (Andersen & al. 2021, 29 – 30. It is very important to ensure the participants' readiness to learn. Participants need to understand their own initiative for a successful training: the necessity for activate participation needs to be highlighted for the participants, and it must be ensured, that they know how to utilise the interactivity tools (Maureen 2021, chapter 8).

What comes to participants readiness to learn, the importance of preparation of virtual training cannot be overemphasised. Participants must be technically and emotionally prepared to virtual training, and it is not enough just to send them an email before the session (LaBorie 2021, 163). Andersen, Nelson and Ronex (2021, 290) are suggesting that in addition to the email invitation, participants should have some pre-work, and the trainer should call them beforehand to check if they have some questions and to clarify the progress of the training.

As a summary could be said that everyone is responsible of the contribution in order to create a good learning experience. However, it is trainer's responsibility to prepare, engage and activate participants to learn. The trainer is responsible for enabling collaborative learning by facilitating social interactivity and enabling feedback. The trainer also facilitates the participants' possibilities to apply the training content in a real-life context. In case of a virtual training, the trainer must be able to utilise the right technology and interactivity tools and guide the participants to use them.

3.3.2 Technical considerations

This chapter is examining the importance of technology in virtual trainings. First the different technical considerations are described in general. Later, different technical tools are presented in terms of improving the learning experience.

The pedagogy for technology enhanced learning should be thoroughly considered because technology evolves. Hence, more complicated technological environments appear, which require more explicit pedagogical considerations. For example, the innovative use of natural language processing (NLP) might be extremely useful to analyse learner's responses and thus align them with certain pedagogical approaches such as social constructivism. (Hammad & al. 2020, 352.) This thesis is focusing on the sudden changes caused by covid-19 pandemic. The change from on-site trainings to classroom trainings has been very rapid, and therefore, it is appropriate to focus on

basic technology, and how the pedagogical aspects can be implemented to virtual environment through these tools.

When talking of virtual trainings, the first technical consideration is the training platform. According to LaBorie (2021, 55) the priority when choosing the platform is that it is easy to use, and it is technically functional. Engagement will not happen if people cannot connect or use the features. Orey (2021, chapter 4) emphasizes the trainer's comfort and experience with the platform and its functionalities. The trainer must be able to use it and to ensure its successful usage from participants' side. Wheeler (2019, 81–82) is also stressing that the technology should be transparent so, that the users can focus on learning instead of worrying how the technology works.

To be able to provide a good learning experience and mitigate the visibility of technology, it is vital to plan the training very carefully. Starting with the basics, the training material should be easily accessible. Sims (2021, chapter 3) is highlighting the importance of organising the learning material, as it is often overlooked in virtual learning. Without an intuitive organization system, it gets time-consuming trying to locate the learning resources. The material should be organised by giving them descriptive names and by saving them in descriptive folders. It is also good to back up the resources to some cloud-based system. When organising the resources, the participants should always be considered as well. Nothing is more frustrating for the participants than not being able to locate something easily in the virtual learning environment.

The accessibility of the training material is just one part of the planning phase. In fact, there should be an implementation plan for the whole training session. Orey (2021, chapter 8) is emphasizing the importance of a clear and detailed implementation plan. This plan should include detailed timing with all the exercises, breaks, and when to use technical interaction tools. If possible, even the polls and breakout rooms should be set in advance. Many platforms, for example Zoom, have the opportunity to create the polls beforehand (LaBorie 2021, 84).

When creating the implementation plan and planning the usage of various interactivity features, it is important to understand their pedagogical purpose. According to LaBorie (2021, 64) there are **interaction tools** to increase engagement during the virtual training. In fact, there are more technical features in the platforms that people realise. However, the features themselves are not creating the engagement, but how they are used.

As noted earlier, it is pivotal for the learning experience that both the trainer and the participants know how to use these interactive tools. It is therefore important, that the tools are simple enough and not requiring special technical skills or vast prior knowledge of digital tools. This thesis presents the most common, basic interaction tools, which are illustrated in figure 5. These tools are

presented more in detail below, and it is clarified how to utilise them to enhance the learning experience.

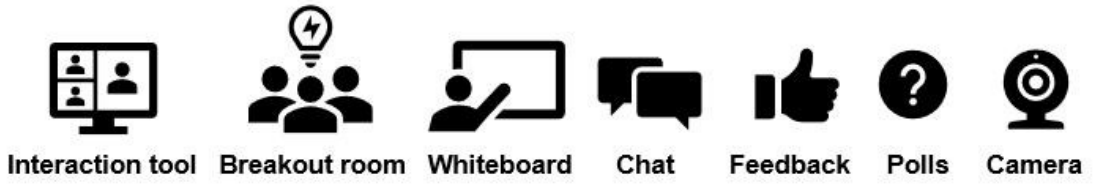

Figure 5. Different technical features in virtual training

Engaging participants since the beginning of virtual training is very important. The training should start with simple questions while participants are settling in. When all participants have arrived and settled, the trainer should introduce himself or herself, preferably using humour. Straight after that, there should be an activity, where participants can meet each other. The more participants get to know each other in the beginning, the more efficient the training. (Orey 2021, chapter 7). To increase the engagement, the participants should be encouraged to be active by themselves since beginning. They could get to know each other for example in small groups in breakout rooms.

A breakout room is a function, that enables working in small groups. Working in small groups is an effective and engaging way to apply key lessons from any training session. Breakout rooms can be used for activities like role plays, problem solving, or case studies where teams are working to find the solution, share ideas or debrief key learning concepts. (LaBorie 2021, 88.) The breakout rooms should be used often enough, and with not more than five participants, as people will typically be more talkative in smaller groups (Andersen & al. 2021, 38).

It is also recommended to provide variation throughout the training, and it should be done every five to ten minutes. Participant's attention span and engagement starts dropping already after five minutes of virtual training, so if the trainer is doing a 45-minute talk backed with PowerPoint slides, the attention of the participants will be low during most of the session. (Andersen & al. 172–173.) Orey (2021, chapter 4) is also highlighting that to keep the training active and engaged, the topic or activity should be changed every ten minutes. The trainer should maintain interactivity by utilising interaction tools like whiteboard and chat.

Whiteboard tool is available in most of the training platforms, and it is a very effective tool to increase collaboration. It replicates the activities done by flipchart: brainstorming, note taking, and diagramming, and it can be shared as well. The **chat** function is usually underestimated. The participants should be encouraged to use chat regularly, for example reacting to each other's comments. Trainers should support an environment in which this kind of "chatversations" are

flourishing. Especially in a small training session an open chat is helpful for collaboration and commentary. (LaBorie 2021, 77 – 79.) Thus, the chat function is a good way to encourage participants also to give feedback to each other.

Every training session is focusing on building up the participants' knowledge from a trainer and giving participants opportunities to apply it through exercises, as well as to receive feedback on their process (Andersen & al. 2021, 17). To keep participants engaged, the trainer must ensure that frequently solicit input and a high level of energy are maintained, both verbal and using technology tools throughout the training (Orey 2021, chapter 1).

The **feedback icons** allow participants to indicate status such as raise hand, green check, and thumb and many more options. The feedback icons are simple and highly effective way to check engagement levels with the participants. Virtual feedback replicates the type of non-verbal communication that participants provide during in-person session when raising their hands and nodding in agreement. Participants should be encouraged to utilize these feedback icons. (LaBorie 2021, 75.) Breakout rooms and chat are also a good way to enable peer-to-peer feedback (Andersen & al. 2021, 295).

Another good way of receiving feedback and ensuring that participants have understood the previous content of the training is to use polls. According to LaBorie (2021, 84) **polling** is a popular and easy feature to efficiently check in with and engage the participants. In the training sessions it is a good way to do the review: participants have a moment to stop and think about what they have just learned.

The usage of a **camera** is also recommended in several sources. According to Andersen, Nelson and Ronex (2021, 38) it is important to everyone's engagement that the video is used as much as possible. Turning on the video increases the engagement, as people are much unlikely to start multitasking and doing other things with their cameras on. Sims (2021, chapter 2) is also recommending using a camera in virtual sessions. A webcam brings a face-to-face component of traditional learning to online classroom for the participants. For the trainer, a webcam gives an opportunity to make personal connection with the participants. When participants can put a face with a name, it may relieve some of the isolation and anxiety of learning online.

Orey (2021, chapter 1) is also agreeing that participants should be encouraged to use their video features when they are speaking, so that they would be better engaged with each other. The problem is that the participants often do not know how to enter in virtual sessions let alone use all the features of the platform for learning and communicating with others (LaBorie 2021, 162). As

several times mentioned, participants' ability to use all the technical tools needed, and thus pay their full attention to the training must be ensured.

Above has been presented, how to utilise different basic tools to improve the learning experience. These tools are needed in virtual environment, because otherwise the interaction is not possible. In the next chapter it will be summarised, how the presented tools, pedagogical principles and the roles of the trainer and participants are enabling a good virtual learning experience.

3.4 Theoretical summary

Virtual training is proven to be a good alternative to in-person training, and there are several advantages of utilising virtual platforms. The key question is, how to improve the virtual delivery to close the gap between virtual and physical delivery. Trainers may need training and practice specifically on delivering content virtually, as the change to the role from in-person trainer to virtual trainer was so sudden. Strategies on how to help participants focus on the content and maximise the teaching quality may narrow the gap between these two formats. (Gross & al. 2022.)

Virtual environment is different to a physical environment because people are not physically in a same place, and that gives different opportunities to collaborate. However, the approach to good virtual session is still very close to good physical session. (Andersen & al. 2021, 28.) At this point, when summarising the theoretical background, it is good to recall the pedagogical principles. These five previously presented principles are illustrated in figure 6. The aim of the training courses is always to learn new skills. Therefore, these five principles should be considered in every training session.

Figure 6: Pedagogical principles studied in this thesis

It is very important to understand these pedagogical principles when considering the technology used in virtual trainings. According to Sims (2021, chapter 2), technology is at the heart of virtual learning, and it is the channel through which learning takes place. Without the right technology, it is not possible to be as productive or efficient. Wheeler (2019, 62, 83) also agrees with the importance of using the right technology. Technology needs relevant pedagogical actions to be fully effective, and it should be used in a way that enhances, extends, and enriches the learning experience.

As virtual environment is different to physical environment, the material may need to be changed to aid participants in better understanding the content. For example, developing new interaction capacity in the virtual classroom, using more relatable real-world case studies, or adapting the presentation could help participants engaged in the class. (Gross & al. 2022.) It is important to adapt the pedagogical aspects also to virtual environment, that the participants are engaged and can follow the content. Andersen, Nelson & Ronex (2021, 28) are confirming, that all the same elements that apply in an on-site session should also be considered in virtual session.

As described earlier, the technology does not have to be complicated or miraculous. Most importantly, its use is designed to be relevant to learning goals, and the trainer and the participants are able to utilise it. Among other things, for this reason it is pivotal to plan the implementation of the training courses detailed enough. Just using technology is something that any trainer can do without much thinking, but when the technology is truly integrated into authentic learning contexts, it requires a great deal of imagination, designing and thinking (Wheeler 2019, 81).

Even a well-designed training anticipates the natural “low-energy” times among the participants during the day. Therefore, it is essential for the trainer to incorporate activities that engage participants, getting their focus back again and enabling them to take part in relevant and meaningful activities, small group discussion, and practice (Orey 2021, chapter 1.) To keep the participants focused and engaged, it is important to keep the learning objectives in mind and use the relevant technology related to pedagogical principles.

There are many previously presented technical interaction tools, which can increase the engagement, interaction, feedback, and activity. However, the contextuality of the training is relying mostly on the trainer. The contextuality is mostly related to trainer’s competence as well as the content and customisation of the training. On the other hand, the contextuality can be provided also with the help of the participants if only they feel involved and responsible for the training and learning experience.

As noted previously, the virtual environment is more challenging environment to the participants, and it requires much more focus and facilitation from the trainer than a normal classroom. Facilitating a two-day or a longer training requires the trainer to have high level of energy, focus, and a keen ability to read the energy level of the participants (Orey 2021, chapter 1). The trainings in AQS are mostly taking from three to five days, which means that the trainer must really stay focused and follow the planned training program. This is also why the role of the participants is important, as they can help providing a better learning experience. For the best possible learning experience, the technical assistant should also be available.

In figure 7, it is summarised, according to theory, what to consider when implementing a good virtual training. It illustrates the different interaction tools and the variation of them by frequent scheduling. It describes for what pedagogical purposes the interaction tools should be used, and that the pedagogical principle of contextuality is mostly related to the trainer. Ideally, the trainer has a technical assistant as a backup to help the trainer and the participants with the technical issues. A technical assistant can attend the training but can also work in the background and help as needed (figure 7). As a final summary, it can be concluded that a good virtual training considers these three elements presented in this chapter: pedagogical principles, relevant and easy-to-use technologies as well as the roles from both trainer's and participants' side.

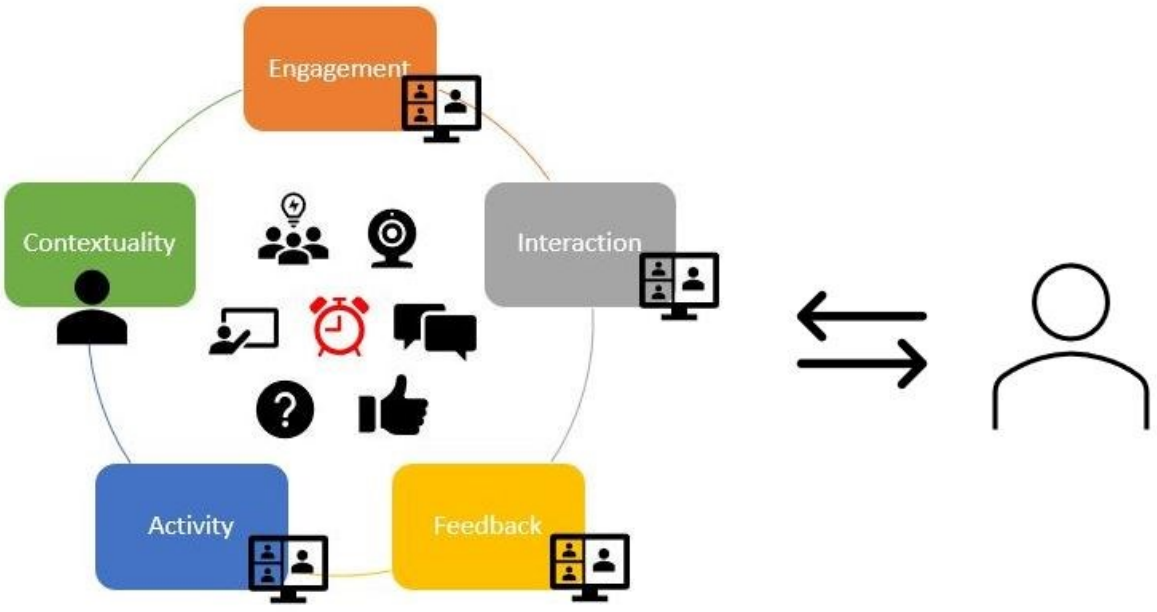

Figure 7. Summary of the considerations in virtual trainings

4 Methodological framework

This thesis is qualitative by nature, and it is following the case study approach. This chapter describes the meaning of qualitative research and describes the typical features of a case study. The meaning of the data analysis is also clarified in this chapter.

The university of Jyväskylä defines qualitative research as an orientation in scientific research which aims to understand the quality, meanings, and properties of an object holistically. There are several different methods for conducting the qualitative research, but what is common to all these methods is that the object under study is viewed from a perspective that focuses on its environment and the background, the purpose, the significance, expression, or language. (Jyväskylän yliopisto 2021.) As the aim is to understand the phenomenon (training course) in a specific environment (virtually) the qualitative research orientation is a proper choice.

A case study is a strategy in qualitative research and its purpose is to study only one or a few objects or phenomena in depth (Jyväskylän yliopisto 2015). Case study is a good choice when research questions are “how” or “why” questions, one has a little or no control over the behavioural events and when the focus of the study is a contemporary phenomenon – a case. (Yin 2018, 2). The research questions in the thesis are mostly open questions. The virtual training courses are contemporary phenomena in AQS as all the trainings were forced to be transformed to online due Covid-19 pandemic. The training courses are also unique occasions, which behavioural events cannot be controlled or predicted. Therefore, it is justified to choose the case study as a strategic approach.

The next chapter defines the concept of a case study and justifies its usage as an approach in this thesis. The purpose of multiple case study is clarified, the cases under study are presented, and it is explained what the key elements are when designing the case study.

4.1 Multiple case study and research design

There are several definitions for a case study. Simons (2009, 21) has defined a case study as an in-depth exploration from multiple perspectives of the uniqueness and complexity of a particular project or system in “real-life” context, which primary purpose is to generate vast understanding of a specific topic. The key difference between case study and other research approaches is, that the case study focuses in detail on a particular example or a small number of examples (Tight 2017, 137). This thesis is focusing on particular examples (training courses) in their real-life context (organised virtually by AQS). Therefore, the case study is a suitable approach for the thesis.

The case study can be single case study, or multiple case study (Gustafsson, 2017, chapter 3.3). This thesis is a multiple case study, and it examines three different cases, more specifically three virtually conducted training courses in AQS. The advantages with multiple case studies are that they create a more convincing theory when the suggestions are more intensely grounded in several empirical evidence. (Gustafsson, 2017, chapter 3.3). In case of training courses, there are many aspects that are very much depending on the trainer and the participants: their personality and mutual interaction. Therefore, it is important to study multiple training courses to avoid making general conclusions by just one training event. In addition, most multiple case studies are likely to be stronger than single case studies (Yin 2018, 24). Thus, it is justified to study three different cases to be able to strengthen the reliability of the thesis and to be able to end up in more convincing results.

Defining the cases is a relevant part of the case study. To study the cases, sufficient access to the relevant data is needed, whether to interview people, review records or make field observations. If it is possible to access to more than a single case, the cases should be chosen so that they will most likely illuminate the research questions. (Yin 2018, 26.) In this thesis, the three cases have been chosen mostly due to accessibility of the data. Another reason to choose especially these cases is, because they are representing a good sample of the training courses in AQS, as they are among the most popular ones and thus give the most reliable answer to the research questions. The cases are Aviation Auditor Training (AAT, case 1), Safety Management System Complete Training (SMS Complete, case 2), and Safety Management System Risk Assessment Training (SMS RAT, case 3). The short case description is illustrated in figure 8.

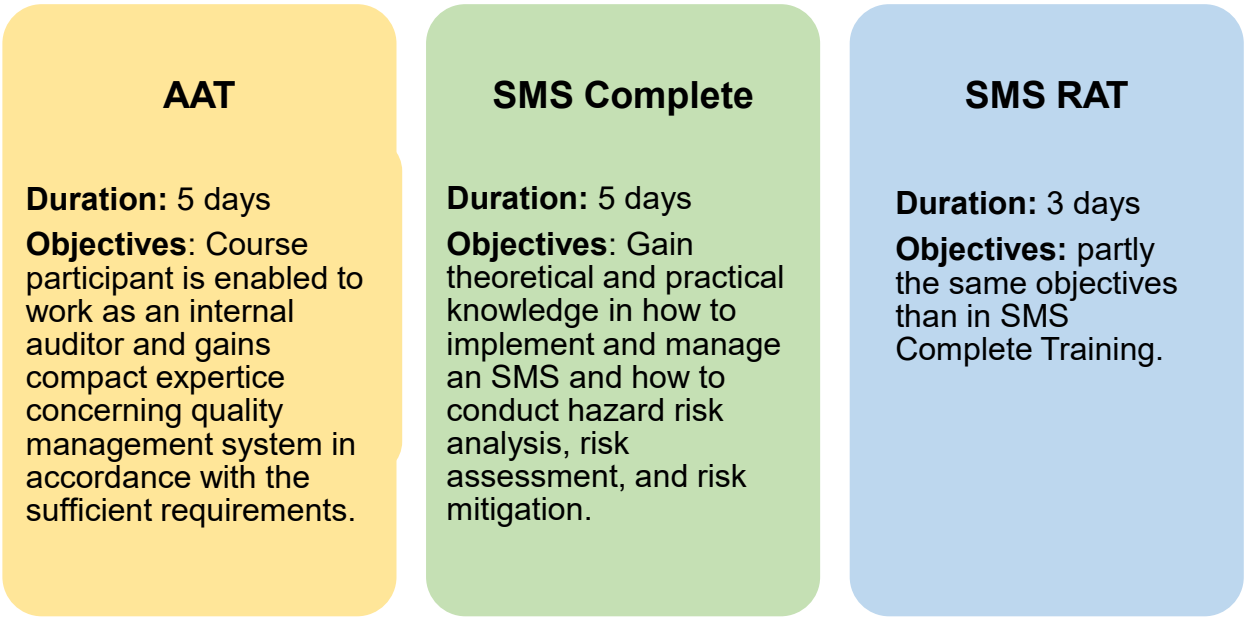

Figure 8. Case description (Aviation Quality Services 2022c; 2022d; 2022e)

The case study can be started with reviewing the literature and defining the research questions. Alternatively, the case study can also be started with the fieldwork, prior to even examining the relevant literature. In the latter version, the perspective is the opposite: it cannot be known, what is relevant or what research questions should be determined, before knowing what is going on in the field. (Yin 2018, 3–4.) In this thesis it is relevant to follow the latter version of Yin's suggestion and start from the field. The aim is to improve virtual training courses in aviation industry. That means, the cases under study are very specific. It is therefore impossible to know what literature is exactly relevant to this topic.

The case study is by nature iterative but linear process (Yin 2018, 1). To be able to focus on relevant theory and study the relevant aspects of the topic, it is good to start with the proper fieldwork and supplement the theory along the way. This thesis starts by observing the training courses and the theory is supplemented afterwards. The preliminary research questions are defined prior to the data collection. However, they are refined along the process when the knowledge increases. The final research questions are presented previously in chapter 2.2.

4.2 Data collection and data analysis

The data for a case study can be collected from many different sources such as documentation, archival records, interviews, direct observations, participant observations, and physical artifacts. None of these sources has a complete advantage over others and a good case study is relying as many sources as possible. (Yin 2018, 113.) To get a comprehensive overview of the virtual training courses, it is important to choose relevant data collecting methods. It is also important to use several different methods.

The major strength of case study data collection is the possibility to utilize many different sources of evidence. This is called data triangulation. Any case study outcome or conclusion is likely to be more convincing and accurate if it is based on multiple sources of information following a similar convergence. (Yin 2018, 126, 128). Aaltio and Puusa (2020, 185) are also emphasising the importance of triangulation: the aim is to get more comprehensive interpretation of the evidence analysis by using multiple sources.

When the data is collected, starts the data analysis. There are several techniques to do the data analysis in a case study. One of the most popular techniques for case study analysis is to use pattern matching logic, which compares an empirically based patterns with the predicted ones (Yin 2018, 179). In this thesis, it is clever to utilise pattern matching technique and find the compatible models from the collected data case by case.

Another way to analyse the data applies when analysing the multiple case study. This other technique is focusing on cross-case synthesis. Using a case-based approach to cross-case synthesis targets to retain the integrity of the entire case and then to compare any within-case patterns across the cases. (Yin 2018, 194, 196.) This thesis is a multiple case study; thus, this technique is also reasonable to utilise. It makes sense to do use the pattern matching technique within each case at a time. After this it is good to compare these patterns to each other to find similarities and differences. The aim is to generalise to achieve the final results.

Gustafsson (2017, 1) notes, that the case study is an intensive study about a person, a unit, or a group of people which is aimed to generalise over several units. Yin is also emphasizing the generalization, and he says it is important to do analytic generalisation and generalise from the case study, not from the cases (Yin 2018, 28). In this thesis, the aim is to understand the phenomenon of virtual training courses in AQS so well, that it is possible to make analytic generalisation to improve these virtual training courses. The generalisation happens by combining the key findings of each case to the existing theory of learning happening in virtual environment. To be able to generalise, it is important to utilise the patterns that apply in all three cases, not the patterns which can be found only in one or two cases. Thus, the results are more reliable and comprehensive. The idea of analytical generalisation in this thesis is visualised in figure 9.

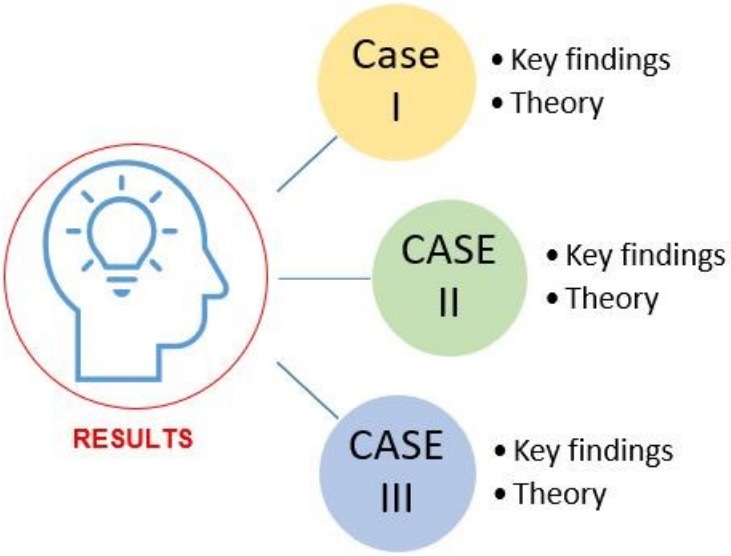

Figure 9. Generalisation from three studied cases

5 Material and methods

This chapter describes the implementation of the thesis, how the material is collected, and how the collected data is documented. The selection of these methods is justified and described more in detail. In the end of this chapter, it is clarified how the data analysis is done.

To enable the data triangulation, three different data collection methods are used in this thesis. These methods are participant observations, expert interviews, and archival records. When doing a case study, it paramount to follow a clear methodological path (Yin 2018, 3). The methodological path of this thesis is built accordingly, and it is strictly followed along the process. The methodological path is illustrated in figure 10.

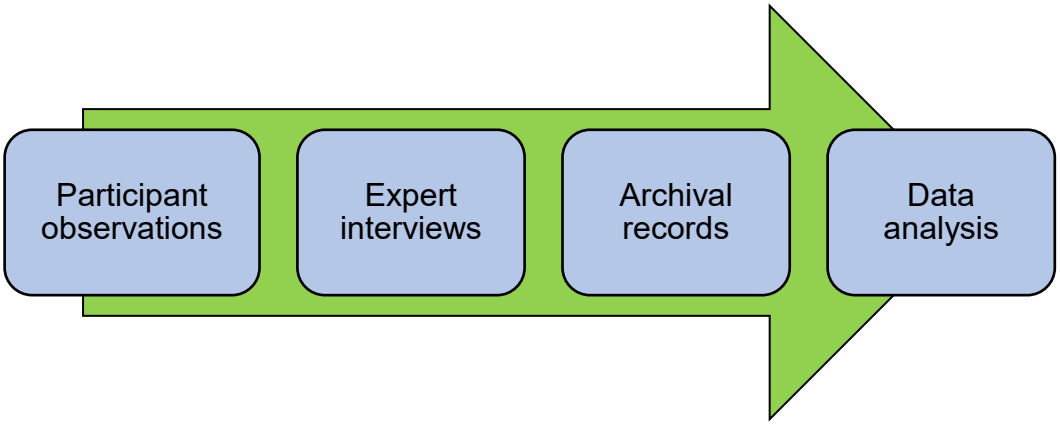

Figure 10. Methodological path of the thesis

5.1 Participant observations

Observation is an excellent research method for getting information about interaction and different group phenomena (Paalumäki & Vähämäki 2020, 132). As described previously, learning does not happen in isolation, but it is a social phenomenon, where interaction plays a significant role. Therefore, being able to observe a real training situation gives much wider perspective to the interaction between the trainer and the participants.

One type of observation methods is participant observation, in which the researcher has clearly the role of an external researcher, although his or her presence and activities also influence the course of the observed phenomenon (Paalumäki & Vähämäki 2020, 133). As the cases under study are virtual trainings, observation without participation wouldn't be possible. The presence of an observer in the training platform will anyway have some influence on the training course.

Participant observation helps to uncover practices and connectivity, which would not know to ask for in an interview (Gartner & Teague 2020, 168). According to Yin (2018, 114) the advantages of participant-observation are contextuality, and immediacy as it covers the actions in real time, and so that it is insightful into interpersonal behaviour and motives. Paalumäki and Vähämäki (2020 132) also highlight that the advantage of utilising observation as a method, is its authenticity because it gives information from a real situation in real time.

The purpose is to gain in-depth understanding of the learning experience in virtual training courses. For example, interaction and feedback between participants and the trainer, or the engagement level of participants during the training cannot be examined only by the interviews. Therefore, participant-observation is a very important data collecting method and starts the methodological path of the thesis (figure 11). Below is clarified more in detail, how this method is used in this thesis.

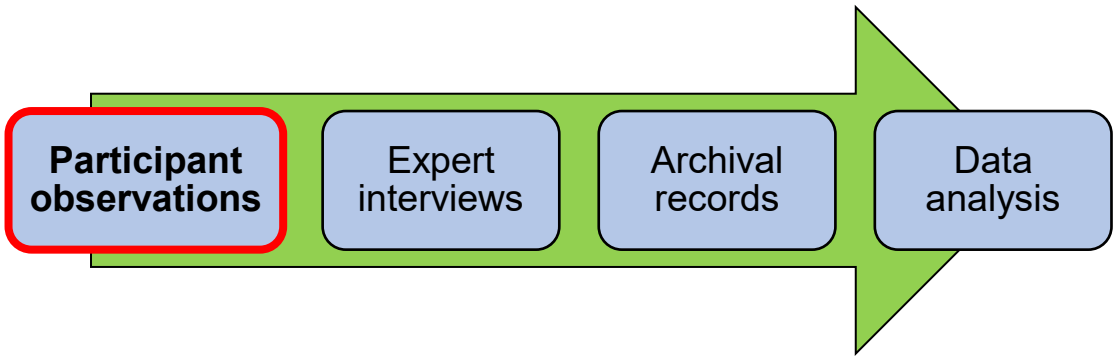

Figure 11. First step of the methodological path of the thesis

Building trust in participant-observation situations is paramount and therefore it is good to have a key person within the organisation to act as an informant and make the initial connections (Paalumäki & Vähämäki 2020, 134). Participant observations were conducted with the support of Director of Operations, Mr. Gerardo Nardiello. The Information Letter (appendix 1) was sent to Mr. Nardiello, and he organised the access to the training courses. After Mr. Nardiello informed the trainer of the observation, the trainer informed the course participants. The observation day was never the first day of the course, so the participants were familiar with each other, and the observations were thus more subtle.

Utilising participant-observation as a data collection method requires proper preparation. It is important to be able to focus on what is relevant to the research problem and not observe everything what is happening (Grönfors 2015, 156). A common way to systemize the data collected by observation is to create in advance a table-like list of the things which should be observed. This list can be supplemented with the details and examples. (Paalumäki & Vähämäki 2020, 134 – 135.) Being

able to focus on the relevant considerations while observations, a table-like list of the essential observation targets was created in advance with Microsoft Excel (appendix 2).

In addition of creating a table-like list for the systemized data collection, it is important to think how to take notes during the observation. Taking notes can disrupt the natural flow of things and to avoid this, it should be decided when, how and how often the notes are taken. (Grönfors 2015, 156.) During the observation the notes were taken by hand. It was more practical to take handwritten notes, as the laptop was used in the observation. In addition, the voice recorder was used during the breaks. That helped to make a quick summary of the findings by far. At the end of the observation, the voice recorder was used to summarise all the findings. This was a good way to complement the handwritten notes.

If the notes are handwritten, it is important to transcribe them for later proper analysis. (Grönfors 2015, 157). Both the handwritten notes and the voice recorder notes were transcribed afterwards to an Excel-file in the template that was created for observation purposes (appendix 2). Every item of the template was first numbered, and then the notes were transcribed to the template and linked to each theme from the list. This numerical order, it would make it easier to analyse them properly in later phase of the case study.

Through participant observation it can be captured *what* people do, and *how* they do. However, *why* they do, cannot be covered only by observing. That is why participant observation is good to combine with other methods. (Gartner & Teague 2020, 170.) To understand what is happening in virtual trainings, how the trainer and participants are acting, and how the technical tools are utilised, it is good to start the data collection with participant observation. To get more comprehensive understanding from the whole phenomenon, other methods are also needed.

5.2 Expert interviews

Interviews are one of the most important sources of case study evidence (Yin 2018, 118). The expert interview is not a specific interview method, although experts are a particular group of interviewees and interviewing experts includes some special features (Alastalo, Åkerman & Vaittinen 2017, chapter 9). This chapter describes the expert interview and justifies its choice as a data collection method.

The methodological advantage of an interview is, that individuals who are known in advance to have experience of the phenomenon and topic under study, can be selected for the interview (Puusa 2020, 106). When talking about expert interviews, the first thing is to think, who is an expert. A person who has in a specific field particular knowledge or skills which people do not commonly have, can be defined as an expert. (Alastalo, & al. 2017, chapter 9.) The topic of this thesis

is quite specific, as it is focusing on virtual training courses in aviation field. To have comprehensive knowledge of the topic needs some particular expertise.

In case studies, the interviews are often like guided conversations rather than structured interviews (Yin 2018, 118). This means, there should not be strictly pre-determinate questions. On the other hand, the aim of the interview is to get as much information as possible about the chosen topic, and as diverse a picture of the phenomenon as possible (Puusa 2020, 106). It is therefore important to know what to ask in the interview situation. An expert interview is often a variation of a thematic interview, in other words semi-structured interview (Alastalo, Åkerman & Vaittinen 2017, chapter 9). Thus, the thematic interviews are a good way to conduct the expert interviews.

Case study interviews may be more focused, for example based on fieldwork. Then, they can take only approximately one hour time, and the purpose of the interviews can then be to corroborate certain findings (Yin 2018, 119.) In this thesis, the interviews are the second data collection method, and they are based on the observations. The aim is to corroborate the data from both methods. Therefore, it is relevant not to keep the interviews too open, and thematic expert interviews are a justified choice for the thesis.

As mentioned previously, participant observations reveal what is happening and how. By interviewing the trainers, it is possible to understand more *why* the specific training methods or technologies are used. It is also possible to ask more specific questions to ensure that the matter is properly understood. One of the research questions is how the trainings are currently conducted. This question cannot be answered only by observing the trainings. The personnel from AQS must be interviewed as well. Therefore, it is a good choice to use expert interviews one data collecting method.

Expert interviews were done after the participant observations, as the methodological path shows (figure 12). Below is explained, how this method was implemented in this thesis. It is clarified, who were interviewed, and what specific interview method was used.

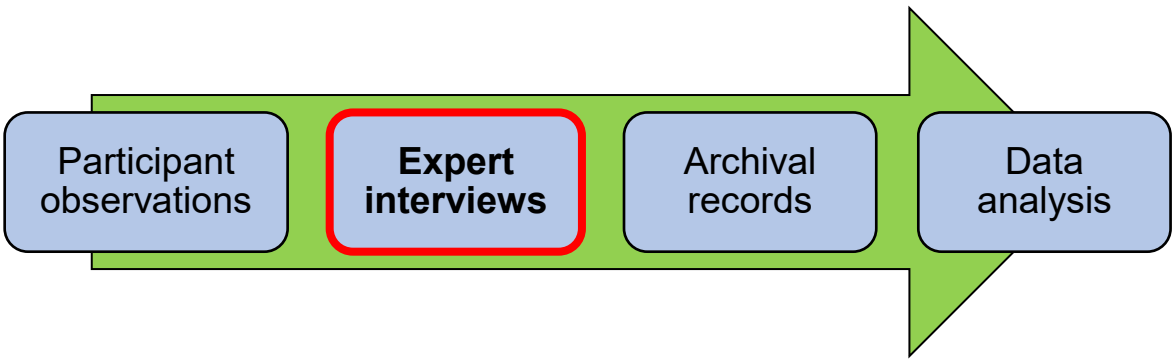

Figure 12. Second step in methodological path of the thesis

Expert interviews were conducted by interviewing five different experts. Three of the five experts interviewed were the trainers of the training courses. Each case under study, i.e., each training course had a different trainer. Therefore, it was justified to interview them all. In addition, two experts from AQS were interviewed. Their role is to develop and oversee the trainings in general and to organise each training course on AQS' side. To be able to answer the research questions from comprehensive perspective enough, it was relevant also to interview AQS personnel.

The interview frames were planned beforehand, and they included both the themes and the support questions for each theme. These themes arose both from preliminary studied learning theories, and from the findings made in participant observations. There were four themes both for AQS personnel and the trainers, the themes differed a little from each other. The themes for AQS personnel were General information, Training process, Customer experience in virtual trainings, and Cooperation with the trainers (Appendix 3). The themes for the trainers were General information, Training session, methods and practices, Customer experience in virtual trainings, and Cooperation with AQS and the potential of virtual trainings (Appendix 4).

General information was asked from both the AQS personnel and the trainers to get an overview of their expertise and thus from what perspective they are answering to the interview. The questions related to Training process -theme were asked from AQS personnel to get familiar with the training process from the perspective of AQS. The aim was also to know how the trainings have been developed during the virtual format. Training session, methods, and practices -theme was asked only from the trainers as the purpose was to understand their perspective to learning and using the technology in virtual trainings. Every expert answered to the Customer experience and the cooperation themes, but the questions varied a little depending on the interviewees position.

The interviewees were informed that the interview is anonymous, and that their interview answers will not be straight referred in the thesis. All the interviews were conducted via Teams meeting. There was not a permission to record them. Therefore, it was important to allocate enough time for the interviews so that there was enough time for making proper notes. After each interview, the voice-record tool was used to summarise the key points of each theme. Both the written and recorded notes were transcribed afterwards for analysis purposes. One of the interviewees suggested to record the meeting so that it would be easier to analyse it afterwards. That interview was transcribed as a whole, even though some key words were also taken during the interview.

5.3 Archival records

Participants have a big role in ensuring the successful training and thus good learning experience. Therefore, it is pivotal to understand the phenomenon also from their perspective. As mentioned

previously, the participant observation can reveal *what* and *how* people are doing, and the interviews are a good way to understand better, *why* people are acting as they are acting. It is neither possible nor reasonable to interview every training participant. Therefore, it is appropriate to use other data collection method alongside observation to understand participants' perspective.

For many case studies, a relevant data can also be collected via archival records, such as survey data produced by the case study's participants (Yin 2018, 117). In this thesis by archival records is meant precisely the survey data from participants. More precisely, feedback from the participants.

It is often possible to find archived documents on the phenomenon selected for research, and in most cases the research questions are formulated so, that the documents in the archives are selected as natural evidence of data. Archives can mean a wide variety of organisations or systems that store a variety of materials and documents. These documents can also be stored in digital form, allowing the archive to be located in internet. (Jyväskylän yliopisto, 2014.) In AQS, customers are asked to fill the anonymous feedback form after each training course. This feedback is archived and used for later development purposes.

The strengths of choosing archival records as a source of evidence are, for example, that they are stable and can be reviewed repeatedly, they are unobtrusive as they are not collected as a result of the case study, and they are specific and can contain details of an event (Yin 2018, 114). It is good to examine the qualitative feedback, which is not collected because of the case study but is a part of own development process of AQS. It is also good to have access to the feedback repeatedly due to recheck something, which is not possible for other methods used in this thesis. On the other hand, the weakness of using the archival records can be, for example, related to accessibility due to privacy reasons. (Yin 2018, 114). The access to the archival records must be ensured already beforehand.

It is important to have a clear image of who is attending to virtual trainings: what they prefer and what they think about the processes. In this way the training can be designed to engage the participants. (Andersen & al. 2021, 104 – 105.) As mentioned previously, ensuring the engagement is the key for learning and thus a good learning experience. By asking participants their opinion of each training course, it is possible to improve the ways to engage them. Examining the feedback from training courses for the purpose of the thesis is therefore self-evident step on the methodological path (figure 13). Below is described, how the archival records were examined.

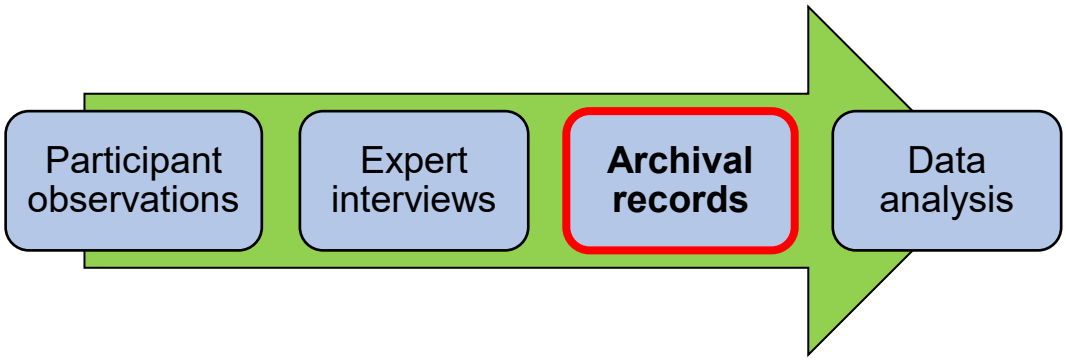

Figure 13. Third step in methodological path of the thesis

Arcival records examined in this thesis were the customer feedback from each training course under study. After each training course, participants were asked to fill the feedback form online. The feedback was asked via Surveymonkey service. The themes asked in the feedback were related to the strengths, improvements, and overall experience of the training course.

After participants fill the form, the feedback is saved in AQS's own archives. As noted earlier, there can be some challenges to reach the archival records due to privacy reasons. It was not possible to get the access to the archives themselves, so the feedback was provided by Training Management Support via email. In this email, the feedback from each course was separated, and the amount of the customers who gave feedback was mentioned. The usefulness of archival records varies from case study to case study (Yin 2018, 117). In this thesis, the archival records were seen useful and valid, as only one customer had not provided the feedback.

5.4 Documentation

Documentation is an essential part of data collection. Therefore, all relevant details from how each case was studied were documented (appendix 5). The documentation includes the details from the case itself, and the information of the observation, the expert interview, and the archival records. As an example, the documentation of the first case is illustrated below in table 2. All the collected material was stored in a folder that was created for each case. Each folder contained the Excel -file from participant observations where the observation notes were transcribed, transcribed interview materials and the customer feedback of each case. Unlike the other expert interviews, the interviews made for AQS personnel were covering each case and not just one of them. Therefore, the material of them was saved in a separated file.

Table 2. Documentation, Case 1

CASE I
Aviation Auditor Training (AAT)
Duration: 13th – 17th of December 2021
Participants: 16 + 1
Platform: Zoom
Observation • 15th of December 2021, 9.00 - 15.30 (UTC+1) • Notes: handwritten, photos and voice records
Interview, Teams • 18th of February 2022, 19.00 - 20.30 (UTC+1) • Notes: Recorded Teams meeting, afterwards transcribed
Archival Records • Customer feedback, qualitative • Number of people provided feedback: 16

As noted, the interviews of AQS personnel were considered on a case-by-case basis. Therefore, they were documented separately (table 3). After collecting all the material, the analysis phase started. In the next chapter, it is clarified how the analysis was conducted.

Table 3. Documentation: interviews of AQS personnel

DIRECTOR OF OPERATIONS	**MANAGER, PLANNING AND LOGISTICS**
Time: 9th of February 2022	**Time**: 15th of February 2022
Duration: 1h 15min	**Duration**: 1h 20min
Notes: Written and voice record, afterwards transcribed	**Notes:** Written and voice record, afterwards transcribed

5.5 Analysing the cases

Data analysis of the thesis started by going through the collected material. First it was appropriate to re-organise some data. As noted previously, for participant observations was created an Excel template to take the notes while observing. The notes were collected in the Excel template (appendix 2) in numeric order. Before starting the analysis, the observation notes were sorted by linking the note and corresponding number with the red circle. The start of this process is illustrated in figure 14. That way it was easier to separate negative and positive findings from each other. It was also possible in the later phase to see, whether all other cases have similar findings.

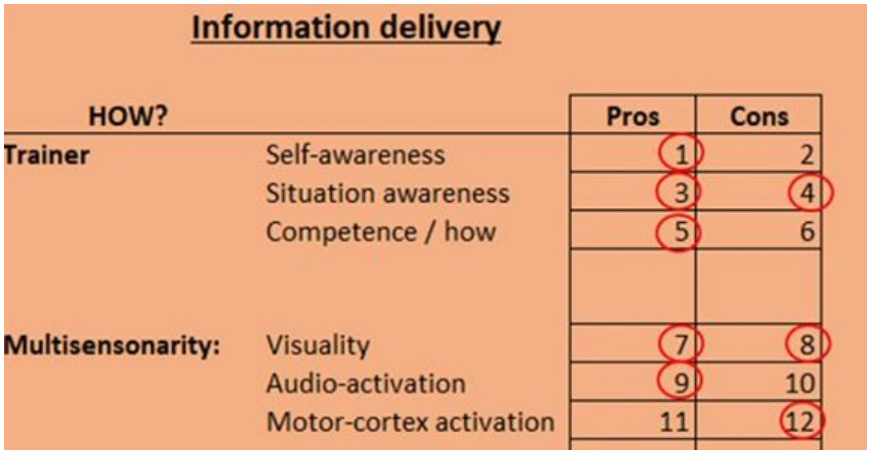

Figure 14: Example of numeric tracking for sorting the data

All the collected data was examined first to get an overview of it, and to take some preliminary notes. After sorting and going through the data, searching relevant patterns started. It was made by going through the collected data case by case. The data of each case was examined several times. Due to data triangulation, the findings from different data collection methods were compared to each other within each case. Case by case, findings from observation, interview of the trainer and AQS personnel, and customer feedback was examined. These findings were compared to each other to find repetitive themes. The repetitive themes that were found, were sorted in an Excel sheet case by case. After this, preliminary conclusions were made from each theme. This phase is illustrated in appendix 6, which shows the themes related to trainer in one case.

The next phase was doing the cross-synthesis between different cases. All those themes, that were present in every case, were collected together. For example, the previously presented theme of the trainer was found from each case. And again, the conclusions that were made related to this theme in each case, were collected and compared to each other. The key finding was formatted from these conclusions. This is illustrated in appendix 7.

6 Results

Above is presented how the analysis of the thesis was made. In this chapter, the key findings of the thesis are revealed and discussed. After that, the research questions are answered. Finally, the analytical generalisation is presented.

The key findings of the thesis give a basis for answering the research questions. Before the final answers, the key findings are compared with the theoretical framework. Key findings are presented in the next chapter.

6.1 Key findings of the thesis

There are five key findings raised from the analysis. All these findings have been raised from all cases together, and with various data collection methods. Key findings are illustrated in figure 15.

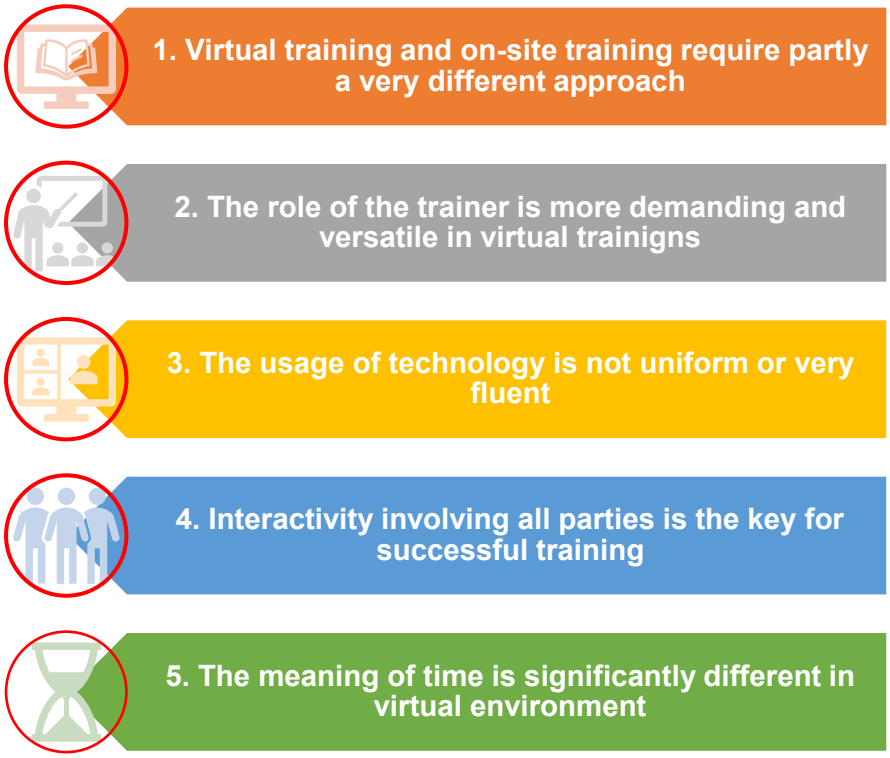

Figure 15: Key findings of the thesis

The key findings are explained more in detail below. They are presented by giving examples of how they were found in different data collection methods. The aim of these examples is to make the findings more convincing and make the research material more visible.

6.1.1 Virtual training and on-site training require partly a very different approach

First and the most significant finding was that virtual training and on-site training are very different kinds of sessions, and thus require different approach and methods. This came up very strongly from observations and interviews. It was also mentioned in feedbacks related to improvements: "*Now a classroom training is online training*". Below is described, how these two implementations differ from each other.

Firstly, the interviews emphasised the importance of changing the presentation to more virtual environment friendly. It was highlighted, that the presentation, in this case PowerPoint slides, cannot be similar than in classroom training: "*In on-site training it is possible to put more text in the slides, because the interaction works well while you are explaining. Versus the online training, where all these kinds of interaction things must go into the material."*; It was stated, that the interaction that normally happens as if by itself, must always be created separately. Therefore, the training material should also be more interactive: "*Especially in these online courses it is important to create slides with example-pictures or videos, to make it more interactive."* More stimulating content was also desired in feedback to improve the training: "*Maybe a video-related part.*"

All the trainers were emphasising, that the nature of the training is interactive. The idea is to learn from each other, not only from the trainer. When the training is not designed to be conducted virtually, it is not so interactive as it could be. In the observation it was shown that the structure of the trainings is very much trainer led, and the participants are not so involved in the training. Note from observations: "*The trainer is explaining very much and not involving participants."* There are exercises and practical tasks for participants to do themselves, but most of the training content is taught by the trainer. This was noted also in the feedback, as the content of the training was wished to be more active: "*The handout could have less text and more time to workshops".*

Another thing was the way to conduct the exercises. It was highlighted, that they should be designed suitable for online trainings. This came up with the feedback: *"I wouldn't attend to a similar course as an online version. As long as it's just a lecture, it is ok, but not with this kind of exercises."* Observations also showed that there are problems with the exercises. The tools used in the exercises were not designed to virtual environment, and thus did not enable co-creation among the participants. For example, PowerPoint or Word document was used in breakout rooms so, that one participant shares the screen and others told their ideas. Some were more active than others.

Some things were also highlighted related to the trainings in general. Some elements are still the same, regardless of the environment. That is why, virtual training requires only partly different approaches and methods than on-site training.

First, all the interviews emphasised the importance of creating an active and good atmosphere that guides participants to learn. In observations it was recognised that every now and then the atmosphere was very relaxed, and the situations contained humour and encouraging feedback: "*Trainer uses appropriate amount of humour and gives time for discussions*." In these situations, participants seemed to be more engaged and dared to share their own experiences as well. These things were also considered as strengths in the feedback: *"shared knowledge from classmates*".

Another thing was related to contextuality of the training. All the interviewed trainers highlighted the importance of knowing the backgrounds of the participants to provide more focused and relevant examples: "*The most time I invest in preparing is that I look at the backgrounds of the people*." In the observations was noted, that the trainer and some of the participants seemed to be extremely experienced, which enabled adding the contextuality in the trainings: "*The trainer uses many examples from real life and challenges participants to think how things would go in real situation*." According to feedback, this was seen as a strength in the trainings as well: *"the instructor is an expert in the field"; "detailed explanations supported by tangible examples".*

6.1.2 The role of the trainer is more demanding and versatile in virtual trainings

The second key finding was related to trainer. It came up, that the role of the trainer in virtual trainings requires more considerations than in on-site training. The challenges with the trainer's role in virtual environment were mostly related to usage of the technology and creating the interaction with the participants.

First, it is good to note, that the trainer is alone responsible of conducting the training. The Training Department in AQS assists the trainer when needed, for example, if participants have problems with accessing the training. Despite that, there is no actual technical assistance available. This means, that the trainer is alone responsible of the training content and the technology. It came up from the interviews: "*In online training you are alone, as you are running the show as an administrator, and the training as facilitator*." The challenge was also noted in the observations, when the trainer had difficulties with for example creating the breakout rooms.

Participants are also alone, as they are physically separated from each other. That means, they do not get support from each other so easy, for example if they have difficulties with understanding the task. According to feedback the support is expected from the trainer: "*It would be helpful, if the trainer could join Group Work more often in case there are still questions to clarify items*".

Another thing is, that in a classroom training, the trainer has more space for improvisation. In a virtual environment it is not so easy. This was noted many times in the interviews: "*In a classroom training the trainer has more flexibility and possibilities to improvise than in virtual training*".

Improvisation is usually needed according to feedback from the participants. For example, if the content is not clear enough, or if the instructions to the exercises need to be clarified. However, to get the feedback was also seen very challenging according to interviews: "*In a classroom training there is more feedback the trainer can get from the participants because eye contact and body language is completely different."; "In a classroom training the trainer can interact in different ways and catch signs from the participant if they have understood or not."*

The challenges with getting the feedback were also noticed via observations. For example, most of the participants had their camera on, but not everyone. Shutting down the camera was considered very challenging also in the interviews. However, according to interviews, the usage of the camera is very dependent on the participants' cultural background. It was also seen that the usage of camera is as a personal thing, thus not required in the trainings. Therefore, it is very important for the trainer to be able to interact and get feedback in other ways, such as with targeted questions: *"When I see people without a turned-on camera, and I go through the slides, I can ask them specific questions, like, Hey Mr. A, what do you think about that."*

All in all, combining the training content to technical considerations makes conducting a training alone in virtual environment very demanding. This is also shown to the participants, as it is mentioned in feedback: "*Very good course, doing it online is a challenge for both, participants and the trainer (even more for the trainer)".*

6.1.3 The usage of technology is not uniform or very fluent

The third finding of the thesis is that the technology plays a very big role in virtual trainings, and it is challenging for both trainer and participants. Currently, the usage of technology is not uniform among the trainers. Technology is also not used smoothly, as both the trainers and the participants have difficulties with it.

First technology-related matter was the usage of training platform. There were two different training platforms used in different training courses: GoToTraining and Zoom. One reason for using GoToTraining, was the ability to upload the material there already beforehand and utilise it in similar trainings later. However, according to observations, GoToTraining was not so easy to use than Zoom. Also in the interviews, the Zoom was more preferred due to its simplicity. "*Zoom is much more user friendly*"; *If I would need to choose between Zoom and GoToTraining, I would choose Zoom*". It was stated in the interviews, that neither of these platforms offer comprehensive tools for conducting the training: "*I think none of these platforms are giving the functionalities I need."* On the other hand, in the interviews was highlighted that the platform itself is not so important, but rather than it is easy to use. "*With the Zoom, the good thing is that most people know how to use it*

already". Regardless of the platform, it was noted in the observations that both the trainer and participants had sometimes difficulties to find the material or the exercises. In some cases, the trainer was not sure if the participants have the correct material.

The second matter were the tools. In different training platforms are different selection of tools. However, the basic tools are available in both platforms. Observations and interviews showed that different trainers have very different ways of utilising technology. Visualisation seemed to be very different in different trainings. For example, some of the trainers used more visualisation techniques than others, such as pen, to visually highlight the key points of the content (figure 16) or showing what is happening next. Some trainers leaned more in the visual elements that were built-in the presentation.

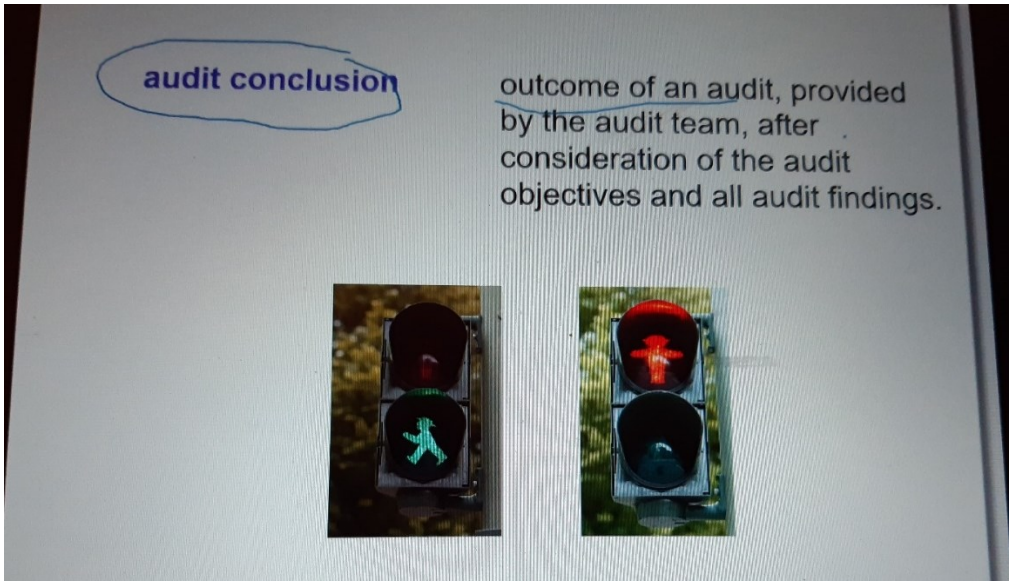

Figure 16. Example, visualisation technique

Activating the participants was considered as a very important thing. The aim of the trainings is to be practical, and thus it is important that there are also practical elements in them. All trainers had different ways of activating the participants. It was noted that some of the trainers utilised more the technique when others used other activation methods.

Activation was important on a large scale, related to exercises. First thing was the usage of whiteboard, which was considered important. With the whiteboard it was possible to create mind-maps or visualise results of brainstorming. It was used in some cases by the trainer. However, it was used precisely by the trainer, not as a real co-creation platform with the participants. The breakout rooms were another thing to activate participants and enable working in small groups. They were

used according to the training structure. However, their usage was always related to some bigger exercise, and not for example as sharing opinions or having short discussion in small groups.

The trainers tried to activate participants also on a small scale, to keep them focused on the topic. In this case also the utilisation of the technology varied very much. One example is raising the hand. Some used this function several times as activation for the questions, like 'who thinks this is a good idea, please raise your hands'. Many trainers mentioned polls in the interviews, but they were not used in the trainings, at least not during the observations.

Another challenge in technology is related to the participants. Participants also have difficulties to use the technology smoothly. It was stated in the interviews, that participants receive the technical instructions in advance the training course. It guides to the usage of the platform and how to access to the training. However, in the interviews was noted, that not every participant is reading the instructions: "*Even people are told how to connect to training, they don't know."*

Some participants had also difficulties with the technology in general. For example, some raised the hand and forgot it up. Some did not have headphones, although they were participating from a noisy place. Some forgot to mute themselves and that caused problems, especially in one case, when doing a small group activity in a breakout room. The breakout session was long, and one participant was attending to another meeting meanwhile. As the participant was not muted, all the others had to hear the other meeting instead of being able to focus on the task at hand.

6.1.4 Interaction involving all parties is the key for successful training

The fourth finding is, that the successful training involves all parties and is as interactive as possible. That was considered to be a key thing in the trainings. Interaction is more challenging in virtual environment, yet a pivotal part of the training.

It was emphasised throughout the interviews, that the nature of the training is to be interactive. "*The difference between training and a school class is that training is much more interactive*." The training is not a lecture, where teacher is explaining, but rather a practical session, where a facilitator is giving the tools to understand the content. "*Trainer's role is to give the key to the material presented, knowledge must become tools*"; "*I call myself a course facilitator, cause the people who attend, they already know something*."

People attending to the training courses have very various backgrounds. Some of them are from very big companies while some from very small ones, some have worked in aviation field for years while some are just starting their career, some are pilots while some have never flown a plane. It

was seen that this is the biggest value of the trainings to share these different experiences with others. Therefore, it is pivotal to be able to interact with others.

As noted earlier, creating the interactive atmosphere to virtual environment is very challenging. It was noticed in the observations, that the larger the group the challenging to involve everyone. For example, feedback and discussions were happening more during breakout sessions when working with small group: "*The breakout room enables peer group feedback: 'good Job A'. People seem to be relaxed, and they talk freely. Everyone has their camera on*."

When the training manages to be interactive the participants are also satisfied. The interaction was noted in several feedbacks: "*Interactive, good participation of all"; "Excellent Team Work"; Good structure, good interaction with the participants, very well prepared."* It is important to ensure that the training course is always interactive, regardless of the training environment.

6.1.5 The meaning of time is significantly different in virtual environment

The last finding was related to time. It was revealed, that in virtual environment the sense of time is very different than in a classroom environment. This result was related to the challenges of time management, as well as the challenges to keep participants' attention.

The time management was seen as the challenge in virtual trainings. One reason was considered to be the lack of possibilities for spontaneous interaction. For example, if there are some un-planned breaks during the training, it feels very long time for the participants to wait that something happens. This was noted in several interviews: "*If the trainer is looking for a document and loses a couple of minutes, it feels like endless time in virtual environment."*

Lack of spontaneous interactions also leads to more accurate use of time: "*You have less time to tell stories, you have more pressure than in a classroom*." It was stated that people are expecting continuous and smooth training, because they are not physically engaged: "*If I am in business trip and go to training room, I have that fully in mind. But if I am home, I am home, and it is difficult to focus*." The punctuality is therefore extremely important in virtual environment. That was also noted in the observations: "*The trainer is late from break. Participants are waiting*." Time management issues were also noted in feedback: "*Time management could be a bit better".*

Time management is also related to the breaks. In the observation it was noted that sometimes there was a long time without break and participants seemed to get distracted. It was stated in the interviews, that in virtual trainings, the need for regular breaks is bigger than in classroom trainings. "*It is important especially in virtual trainings to have enough breaks*." The breaks should also be

planned with the participants. "*First thing is to plan the breaks according to the needs of the participants. My experience is that doing 45 minutes training and 15 minutes break is good*."

The breaks are a good way to keep participants focused, as people can concentrate only a little time at once. It was mentioned in the interviews, that people need to be 'drawn back' regularly. "*I can attract the attention of people every ten minutes, I cannot expect ten continuous minutes, but every ten minute I can try to get the people back by for example asking a question. It is not important what the question is, but it is more a request for people to come back."* Understanding the different sense of time between virtual and physical environment is very important.

6.2 Discussion of the findings

The key findings of the thesis are presented above. In this chapter, these findings are reflected to the theoretical framework. That way, the research questions can be answered, and analytical generalisation can be done.

In general, the pedagogy is very well present in the training courses. In chapter 3.1, three traditions of learning were presented. It seems, that the training courses in AQS are strongly designed from the situative perspective. The aim is to learn from each other, and the importance of interactivity and experienced training participants was highlighted in all the data sources. The training courses also have constructive elements. The idea of constructivism is to build new information on top of the prior knowledge. This is of course the idea of the professional training courses as well, when participants already have prior knowledge. The training content and their examples and exercises are supporting this perspective. There are many tasks where participants must explain how they would implement the given example in their own work. One method was also to use the scenario thinking, which is also supporting the idea of constructivism, as one of its methods is based on problem solving.

The first finding is mostly related to the preparation phase. It was strongly emphasised in the theory, for example according to Orey and LaBorie, that a good virtual training requires very detailed planning. The training materials and exercises must be designed to be suitable for virtual environment. Gross, Ling, Richardson, and Quan came also to very similar results in their own research related to virtual trainings, as stated previously. In the finding it was stated that the approach to virtual trainings is only partly different. That was also noted by Andersen, Nelson and Ronex as they agreed that both trainings should contain same elements but only in different environments. The finding indicates mostly the perspective of the trainer. However, the difference of the environment and the need for proper preparation and mental state for participants was also noted in several sources as noted in chapter 3.3.1.

The second finding is also corroborative with the theory. As stated previously, according to LaBorie, the trainer must consider many things simultaneously in virtual trainings, because he or she is responsible of taking the lead on the learning content and the participant's connection to it, and the contextuality to the real world. As in this thesis is not examined the on-site format of the trainings, this finding cannot be fully comparable. However, the thesis is focusing on the current situation, and at least now, when the virtual platform is a relatively new environment for the trainers, it seems to be more demanding. The current challenging situation related to both, participants and the trainers was also noted in chapter 3.3.1 that was describing the different roles during the virtual training.

The usage of technology is not currently uniform or fluent in AQS. This applies with the trainers and participants. It was noted by LaBorie, that there are more interaction tools in basic platforms that people realise, but that the usage of them alone does not create engagement. As stated also in chapter 3.1, the pedagogy should be considered when designing virtual trainings. It seems that every trainer is using the tools they are familiar with, which is a good thing. However, the usage of them is not fully designed to support the pedagogical principles, or entirely considered. As Wheeler noted previously, using technology incidentally is easy, but to really integrate it as a part of the training course requires very in detail designing and thinking. Participants' technical challenges were also considered in theory. It was for example noted by LaBorie, that they tend not to read the instructions on their own intiative, which causes problems with the technology in actual training session.

Fourth finding was related to the importance of interactivity in the training courses. One of the pedagogical principles studied in this thesis was precicely interactivity. The tradition of situative learning theory also emphasises the interactive learning environment. It was noted in chapter 3.1, that the virtual training can be based on situative approach if the social participation applies. Hence, it can be said that the pedagogy-related theory is supporting the fourth key finding.

The last finding was related to the sense of time. It is interesting, that on the other hand there is a lot of time saved when participating the trainings virtually, for example from home without the need for travelling. But on the other hand, the time feels more valuable in virtual environment, and the attention span starts decreasing very quickly. It was noted by Andersen, Nelson and Ronex, as well as by Orey, that the time what people can focus at once, is five, maximum ten minutes. The concentration span was also mentioned in the findings.

All the findings are different by nature, but they have some common elements. First common element is the importance of proper preparation. As noted by Orey, in virtual trainings the design should be even so detailed, that all the breaks, polls, and other interactive considerations are

planned and set in advance. If this is not the case, the risk of lacking the interaction and engagement increases.

Preparation is therefore also related to the pedagogical aspects of the training. The aim in the training is always to learn something. It was stated in several sources of the theoretical frame, and in the findings as well, that the pedagogical principles are the same regardless of the environment. The trainers were highlighting the importance of interaction, engagement, activity, feedback and contextuality. The difference is that in virtual environment the implementation of these elements must be built-in the training in advance.

One thing, why detailed preparation is needed is related to the role of the trainer. For example, LaBorie as well as Anderse, Nelson and Ronex suggested, that in virtual trainings should be an assistant to guide participants with technical questions, and set the technology-related tasks, such as polls and breakout rooms for participants. Thus, the trainer could have time to focus on the pedagogical and content-related aspects. When the trainer is alone, he or she must conduct the training alone. It is not impossible to conduct the training alone, but especially then, it must be very well prepared.

Another common element for all the findings is technology. It was very strongly present in every finding, and especially then, when the usage of it was not fluent and natural. In the theory, for example Wheeler was emphasising, that the technology should be transparent and exist just to support the learning. The technology should be only a side issue in the training course. The tools are, as the name implies, tools for creating the learning experience. Thus, the tools should be designed to serve this purpose staying as invisible as possible. This is also related to the preparation, as the usage of the tools is not designed from a learning perspective.

In chapter 3.3.2 as well as 3.4, it was noted that the virtual environment provides different opportunities to collaboration, and therefore the recommended to utilise various tools to create the engagement in virtual trainings. It was noted that in virtual environment some basic elements related to interaction and engagement are missing by nature. Therefore, these elements must be created by the tools. For example, in the findings it was stated that getting the feedback is very difficult in virtual training. However, the features for getting the feedback were not used actively. In theory, it was for example suggested to use feedback icons and chat for these purposes.

It seems that the theory supports the key findings. Theoretical framework and the key findings are broadly consistent. The research questions are answered below accordingly.

6.2.1 Answers to the research questions

There were four different research questions in this thesis. First of them was, **how virtual training courses are currently conducted in AQS.** First, the question is answered based on the key findings and theoretical framework. After that, to get more comprehensive understanding of the situation, the overall process of conducting the training courses is described. The process description is based mainly on the interviews.

As noted earlier, the trainings are planned to follow situative learning tradition with constructive elements. This question is however, focusing on precisely the perspective of virtual environment and current training conduction in. In chapter 3.4 was stated, that three important things to consider in successful virtual trainings are pedagogical principles, the roles of the trainer and the participants, and technology. The figure 17 summarises the current situation in AQS. The results of the thesis note that the pedagogical principles are considered well, as the whole idea of the trainings is to be practical and active. All the trainers are also very well aware of the pedagogical aspects. As stated, the role of the trainer is demanding and would require more in detailed preparation, because he is alone in the situation. There is help available, but only when needed. The technology is currently in the most minor role, as all the available technology is not utilised (figure 17).

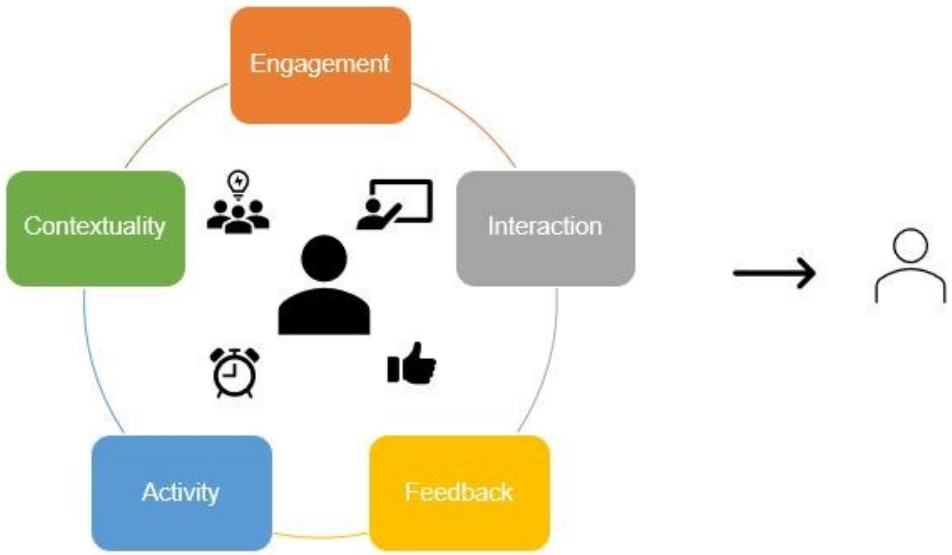

Figure 17. The current situation with virtual trainings in AQS

The full process, of how the trainings are currently conducted, is illustrated in appendix 8. The process can be divided in three phases: preparation, implementation, and evaluation. There are four different parties involved in the process: Sales Department, Training Department, freelancer trainers, and participants. These parties are representing three different stakeholders: Organiser (AQS:

Sales and Training Departments), Partner (freelance trainers), and Customer (training participants). The actions of these different stakeholders in different phases of the process are explained below.

To the preparing phase can be included all the actions what are happening prior to the training course. The very first step is creating a training calendar for the whole year. That is made by Head of Sales. After that, the Training Department takes the liability of the trainings. Planning starts about two to three months prior the training course, when the Training Department contacts to the possible trainer to conduct to the course. Trainers are familiar freelancers, and they are chosen to the specific training course due to experience and availability. About one month before the course, the training material is added to the training platform. The training is confirmed two weeks prior to start, if there are enough participants enrolled. In case there are not enough participants, the training will be cancelled, and the trainer and the enrolled participants informed. When it is confirmed that the training is going to happen, two weeks prior to starting day, the training material is sent to the trainer. He or she will also get a set up file, including the presentation and information of the participants, such as the company and position. One week before the training, participants will receive a Welcome-email, which includes the information of the trainer, training material, log-in data, and link to access to the training platform, and technical instructions.

The implementation part contains the actual training, that in most cases takes three or five days. The trainer conducts the training, and if participants or the trainer have some problems when joining the training, they can contact the Training Department. The training starts immediately, and there is no separately scheduled warm-up session, for example to test the platform and its features. On the last day of the training, participants do the exam, and they are asked to provide feedback. The exam and the feedback are done with the SurveyMonkey -service.

After the training course, starts the evaluation phase. Within one week after the training, participants will receive a Thanking-email, which includes the Quality Card, prepared by Sales. With the Quality Card, participants can get some discount from the next possible training sessions. The feedback is analysed by Training Department and shared with the trainers. If the feedback is very good, the trainer will get a financial bonus. In that case the feedback is also shared with Sales Department.

Above is presented the overall process of conducting the virtual training courses in AQS. As seen, different stakeholders have their own role in it. The process is largely consistent and clear. Participants are considered not only before the training but also afterwards, which increases the commitment and interest for the next training courses. The trainers are already familiar to AQS and vice

versa, which increases the mutual trust. All the trainers, and in most cases also the participants are very experienced in aviation industry, which is also a noteworthy fact.

The conduction process is designed to answer the needs of the on-site trainings, and for those purposes it most probably fits well. However, the first result of the thesis reveals that the virtual training and on-site training require partly a very different approach and methods. Therefore, there are some points in the process, which cause challenges in virtual implementation. These challenges are described below, when the second research question is answered.

The second research question was **what kind of challenges applies when conducting training courses virtually.** The answer to this question has been achieved by comparing the above-described process to the key findings of the thesis. The challenges are presented by different phases of the conduction process.

First, it is good to look at the preparation phase from the perspective of different stakeholders. Sales Department and Training Department have a role of organising the training. They are the contact between the trainer and participants, and they provide the training platform, materials, and exercises. The trainer has a role as a partner, who conducts the training with the provided materials and tools in a pre-determined structure. In other words, the training content is very much prepared by the AQS, leaving the trainer a little separate part of the preparation process. The participants also, who have a significant role in the training course, are remaining a little to aside in terms of communication, and thus lacking the strong engagement. As stated earlier, virtual trainings must be designed very in detail. Therefore, the current structure of the preparation phase causes several challenges.

First concrete challenge is the training material. As mentioned in the theoretical part, for example organising the training material in the intuitive order is very important, yet often ignored part of especially virtual trainings. In the implementation process, the AQS is providing the training materials and presentation, as well as adding the content in training platform. This means, the material is named and organised by AQS, and the trainer might not be able to understand the logic behind the organising system.

Another challenge is the usage of specific training platform. The platform and all related things such as log in data, are provided and organised by AQS. As noted earlier, the platform might not be the one that the trainer would use. It was emphasised in theory, that it is pivotal that the trainer and the participants are familiar with the training platform and its features.

As the process description shows, the participants are contacted two times prior to training by AQS. When participants are enrolling to the training course, they receive and automatic

confirmation email, and one week prior the training, they will receive the Welcome Letter. In other words, all communication with the participants happens mainly via email by AQS. As noted in chapter 3.2.1 and the results, engaging the participants to the training is one of the key things to provide a successful training and useful learning experience. It is not easy for participants to engage and take the role as an active participant, if they are neither familiar with the trainer nor each other. And as the training starts immediately in the morning of the first training day, it also causes challenges in terms of engagement.

Andersen, Nelson and Ronex suggested previously, the trainer would call to the participants already prior to the training. That was suggested due to engagement, and to ensure that participants know how to use the needed technology during the training course. It was noted also by LaBorie and in the results, that the participants are most likely not reading the instructions, if they receive them via email.

If the design of the training course is not detailed enough, it leads to the challenges when conducting the actual training. Thus, there are currently some challenges related to implementation phase, which are all noted in the theoretical framework as well as in the results. First concrete challenge is the implementation of the exercises, which are designed to on-site trainings. The content of the exercises is good, and the contextuality is considered very well. However, results were highlighting that these kinds of exercises are not suitable for virtual environment. Another challenge is the roles of the trainer and the participants. As noted in theory and the results, the training should be an interactive event. As the results show, currently the training is more trainer-led, and the important role of the participants is not fully considered.

The last phase of the conduction process is evaluation phase. There are not so many challenges related precisely to virtual format of trainings, as the training is already over at this stage. However, it is good to note that the previously mentioned challenges with the communication between different stakeholders apply also in the last phase of the conduction process. As seen in the process, the communication happens via email. The training, and at the same time the role of the trainer is evaluated by the participants. The trainer receives the feedback via email, but it is not actually discussed with him or her. Especially, when the format of the training is new, in this case virtual implementation, it would be very important to always hear some background factors behind the feedback. Trainers have valuable insights of the training session: what works, what does not and why.

As a summary it can be said that the biggest challenges that apply when conducting virtual training courses are related to three main things. First, the preparation phase does not consider the nature of virtual environment, thus the material and exercises are designed to the on-site environment. Second, there is not enough communication between different stakeholders during the preparation

phase, which causes that the trainer is not strongly involved in the designing of the training, and participants are not engaged enough. Third challenge is that the knowledge of the technology is not good enough to make it pedagogically relevant, yet invisible during the training. These challenges are visualised in table 4.

Table 4. Challenges in the training conduction process

PREPARATION	IMPLEMENTATION	EVALUATION
COMMUNICATION		COMMUNICATION
VIRTUAL ENVIRONMENT	VIRTUAL ENVIRONMENT	
TECHNOLOGY	TECHNOLOGY	

The third research question was **what kind of digital opportunities can be utilised in virtual training courses.** The answer to this question was achieved partly already by theoretical framework, and it was also considered in the third key finding. Therefore, the actual tools are no longer discussed. The question is briefly answered by considering both the trainer's and participant's perspective.

As stated previously, the technology does not have to be miraculous or great. On the contrary it must be easy to use. Many presented basic tools, when used correctly, are excellent for facilitating the learning session. The technological opportunities from trainer's perspective are provided via training platforms currently used. It was noted in the results that the platforms are not perfect when conducting the training course. However, there are many tools which are not currently in optimal use. Again, it is more related to the lack of design than lack of the tools.

As noted in chapter 3.3.2, it is possible to create many functionalities already in advance, also in Zoom. If there is a detailed plan for conducting the training course, for example polls and breakout rooms can be added into the presentation and set already in advance. That way the actual training session becomes smoother, and thus the technology more transparent.

There are also opportunities outside the training platform. There are many co-creation platforms available online free of charge. However, some of them require logging in. These platforms can be shared via link to everyone so, that all the participants can create their ideas simultaneously. For example, Miro, is a collaborative whiteboard platform online, which has also ready templates to start with. The content for the task can be prepared in advance and shared via link to the training participants. Again, the key is the preparation in advance.

Participants also have possibilities to utilise various tools to interact. They can for example show their opinion via feedback icon or share feedback to each other via chat window. All the tools are there. But as stated in chapter 3.3.1, the situation is new. Therefore, the culture for using these tools during the training must be created. Planning and proper preparation helps also in this.

The last research question was, **how the learning experience could be improved in virtual trainings**. The answer to this question was achieved by looking at the current challenges shown in research question two and finding the answers to beat these challenges.

There were three main challenges in the current process of conducting training courses. First one was, that the preparation is not detailed enough. To be able to provide enhances learning experience for the participants, the preparation process should be redesigned for serving the purposes in virtual trainings.

First, the material should be designed for virtual trainings. For example, there should be separate Handouts and PowerPoint presentations. The Handout should contain the full content, and the PowerPoint should contain only little text, many pictures, and other visualising elements. The presentation should also contain polls and smaller tasks to activate the participants in regular basis. In addition to bigger exercises, there should be multiple smaller group activities for solving some little problem or discuss about some scenarios. This would support the idea of situative learning with constructivist elements, which were discussed in chapter 3.1.

Another challenge was related to lack of communication between different stakeholders. The communication between AQS and the trainers should be increased, especially when planning the training courses. It should be ensured, that the training materials are available and easily accessible, and that the training platform and its functionalities are preferred by the trainer. The training course is provided by AQS and delivered by the trainers. It is therefore important that the communication and understanding of the challenges from both sides is in sufficient level.

The communication challenge was also related to the participants. That could be increased between the trainer and the participant already prior to training. As noted previously, one good way is to call to the participants. Another way could be to start increasing the interest and engagement already in the enrolment phase. There could for example be a little task to orientate to the upcoming training, or some training-related specific questions that could then be sent to trainers to increase their knowledge of the participants' backgrounds as well. Another way would be to inform the participants already in enrolment phase, who the trainer is. Currently they are informed about the trainer via Welcome Letter. This could increase the engagement and interest towards that

specific training course if they would know already beforehand, that the trainer in this course is a specialist in this specific field and as a trainer he or she prefers these kinds of methods.

Third challenge was related to technology. The trainer must be able to utilise various tools to enhance the learning experience. Therefore, it could be good to have a little training or a workshop for the trainers related to these skills. As stated in chapter 3.4, the trainers are in new situation and therefore they might need information of the considerations related to their new role in virtual format. To provide this kind of information, one option could also be to have a possibility for the trainers to briefly observe other trainers and how they are facilitating the sessions. It must be noted that observing different training courses is an eye-opening experience.

In general, to improve the learning experience in virtual trainings the mindset must be turned to the pedagogical principles. It must be considered all the time, how these principles are implemented in virtual environment in a best possible way. As Andersen, Nelson and Ronex stated previously, it is good to think through the training in physical environment and ensure that these elements are implemented also in virtual environment. In other words, each element in a classroom training should be redesigned to consider the requirements of virtual environment. If a classroom training starts with the coffee break, there is a reason for that (increasing engagement and interactivity). There is no coffee break in virtual environment. However, that element must still be there.

One example to replace the coffee break could be to create a warm-up session half an hour before the actual training starts. During that session, all the features of the training platform are presented, the code of conduct is discussed, and the participants are shared in small groups in breakout sessions to get to know each other. There should be a task for the participants to do in small group. For example, ‘what are the objectives and the inputs of this small group for the training session today’. In the start of actual training, this task could be presented and thus get the engaged and relevant start for the course. There is currently an introduction phase in the trainings as well. However, if someone is late or have problems of accessing the training, it is not ideal situation for interacting with each other. Also, if the training has many participants, introducing one’s own background and the objectives for the training can stay at mild level. As noted in chapter 3.3.2, people tend to be more talkative in small groups.

6.2.2 Analytical generalisations

As noted earlier, the aim of each case study is to create an analytical generalisation. The generalisation has been made by combining the key findings with the theoretical framework. From the comparison, two general conclusions have been done. They are presented briefly below.

It can be stated that everything that matters for successful training culminates in the right kind of design. If the training is not planned in detail, the role of the trainer grows, and participants are left in a minor role. Planning is thereby linked also to strengthening the role of the participants in actual situation. In other words, if participants are not prepared to engage in the training, the role of the trainer changes to an active lecturer, while the participants become passive listeners. That causes the effect that the aim of learning from each other does not apply anymore.

Another generalisation is, that the more the technology is utilised, the more invisible it becomes. Every virtual training requires utilisation of the technology to fill the necessity of pedagogical principles. If the technology is really integrated as a part of the training session and used regularly, and fluently, it will receive less attention. And that is the purpose of the whole design.

As noted previously, the theory and the findings of the thesis are broadly consistent and support each other. However, as a phenomenon on this scale, virtual training is a new and sudden and needs more research in the future. Therefore, comprehensive generalisations cannot be made. These two things related to the importance of designing and the taking into account the technology through pedagogy are considered to be generalisable.

7 Discussion and evaluation

The purpose of this final chapter is to summarise and evaluate the thesis as a whole. In this chapter, the results of the thesis are brought to practice. It is discussed, how the results can be utilised in AQS, and what further development ideas were born during the process. This chapter also evaluates whether the objectives of the thesis were achieved, and how the process was conducted.

First, the final conclusions of the thesis are summarised. Then, the concrete outcomes are presented, and further research is considered. Finally, the reliability and validity of the thesis are evaluated, as well as the author's own role and actions.

7.1 Final conclusions

The results of the thesis showed that the way the training courses are currently conducted is designed to serve the classroom implementation. The trainings which were planned for classroom setup, were transferred to virtual environment as such. They have not been developed since.

The classroom setup in virtual environment causes several challenges. Virtual environment is different by nature, and thus require different considerations. Virtual trainings require also much more detailed preparation what comes to the material organised by AQS, and the implementation conducted by the trainers.

The role of the trainer is significantly different in virtual trainings. That should be considered carefully. To avoid the risk, that the trainer becomes a lecturer, and the participants become passive listeners, better preparation, and more interactivity built-in the materials is needed.

The situative tradition is based on learning from each other, and that seems to be the ground approach in the training courses in AQS. It is also mentioned as an objective in their webpage. Situative approach requires social participation, and therefore, the interactivity is one central element of the training courses.

The pedagogical principles are mainly implemented in the training courses. Due to expertise trainers and AQS personnel, the idea of pedagogy is strongly present. The basic idea of practical and common learning in training courses also supports the implementation of pedagogy in general. This was also considered as a strength from customers' perspective.

The main challenge is, that the utilisation of technology is not in a sufficient level. Hence, the pedagogical principles or situative approach cannot be fully implemented. The challenge is mostly related to the insufficient design phase. It seems that currently all the trainers are using the technology, without designing its usage to be a natural, and transparent part of the training courses. That

affects also to technological abilities of the participants, as well as the possibilities to social and active participation. For example, more co-creation tools should be used in exercises. The trainers might need more training and experience from virtual delivery.

The communication between the training organiser (AQS) and the partners (freelance trainers) is insufficient, especially when planning the training courses. There seems to be a gap between AQS providing the materials and exercises, and the trainers conducting the training. The gab might not be visible in on-site trainings that are more flexible by nature and not requiring technical considerations. The participants should also be considered more carefully prior the training course due to engagement.

As a summary, can be stated, that the training conduction process should be redesigned to serve better the virtual trainings. Cooperation between AQS and the trainers should be strengthened, especially now, when planning the new delivery of the training courses. It must also be noted that the personnel in AQS and the trainers have a vast knowledge of the aviation field and pedagogical considerations. Therefore, cooperation is certainly fruitful.

7.2 Outcomes and suggestions for AQS

It was noted several times throughout the thesis, that despite the challenges, virtual trainings also have many benefits. They can be organised regardless of the time-zone, and the companies and participants can save time and money with the reduced travelling costs. It is clear, that even though the pandemic is receding, the virtual format of the training has come to stay. Now, it is an ideal point of starting to develop them.

It is important to understand, that these training types are two different kinds of sessions. Therefore, they require different set up of skills from participants and especially from the trainer. It is a challenge, but more an opportunity to create two different products to the training portfolio. This is also adding the customer value when they have later more possibilities to choose from.

To apply the results of the thesis in practice, the thesis has three concrete outcomes. Their purpose is to help AQS to get started with mastering the virtual training courses. This is a starting point, and in the future, the virtual trainings can be a valuable part of AQS’s training portfolio.

The aim of the thesis was to study the current state of conducting training courses virtually and find possible improvements to them. Therefore, the first outcome of the thesis is a list of considerations for further development (appendix 9). The first outcome is formatted considering the feedback of the commissioner, which is described more in detail in chapter 7.5. The list is based on the results of the thesis, especially in the research questions two and four related to challenges and

improvement ideas of virtual training courses. According to the feedback from AQS, it is also considered, that the purpose is not to re-design the training courses, but rather to start developing them with the small steps considering the current resources and tools.

Second outcome is an instructional video. It was noted in the thesis, that there is currently no training for the trainers prior conducting the virtual courses. AQS do not have common instructions for virtual delivery. The instructional video is likely to be helpful for this purpose. The video is targeted mainly to the trainers, who already have experience of conducting training courses, but not so much of virtual environment. The video is summarising the key considerations related to training courses in virtual environment.

The instructional video starts with explaining the purpose and the target group of the video. After that, there are three main categories. First one is design, which contains the topics of purpose, technology, training material and roles. Second one is the implementation, which contains the topics of beginning, timing, the trainer. The last theme is evaluation which reminds of the purpose of feedback. In the end of the video is a disclaimer, which explains where further information can be found. The duration of the video is 22 minutes 29 seconds. As the results of the thesis already show, the concentration span of people is quite short and therefore it might be good to watch it in parts. Content and its timing, as well as the link for the video can be found as appendix 10.

The third concrete outcome of the thesis is a Checklist for Virtual Trainings. The checklist is targeted for both the trainers and AQS. The purpose of the checklist is to be a reminder of important aspects when planning trainings. It covers pedagogical principles, preparation phase with its various considerations, different roles and responsibilities, and other considerations related to virtual environment, such as micro-involvements. The checklist can be found as appendix 11.

7.3 Suggestions for further research

The situation with virtual training courses is relatively new. Therefore, they need further research from different aspects. They can be studied both from AQS's perspective and in general. Below are some suggestions for the topics of further research.

First is good to look at AQS and its further needs. In this thesis, suggestions for further development were found and presented as in the first outcome. Related to that, there are few things what would need to be studied more in detail.

Firstly, this thesis was not focusing on the financial aspects but rather the learning experience. Developing the training courses always needs investments. Therefore, a comprehensive business analysis should be done to evaluate the risks and benefits before further investments in virtual

training courses. There are many models to use for making business analysis considering different relevant perspectives. In addition, the business model of AQS should be considered in strategical level. Not only financial investments, but developing new product, such as virtual training course needs resources and commitment from the company as well.

In addition to business, there are many things related to the training courses itself. For example, through this thesis cannot be addressed, whether some training courses are more suitable for virtual format by their content. Therefore, one study could be made from this perspective. That way the company would know, if there are some trainings that should be conducted in a classroom format also in the future.

Another research should be targeted straight to the customers. For example, a comprehensive survey to find out their opinions of the virtual format. Maybe also interviewing some regular customers as well. This data could be compared to previous feedback of virtual training courses. Another, more time-, and resources-consuming option is to create a real service design sprint and request the customer to co-creating a model for user-friendly, and pedagogical virtual training environment.

In the future, when assumably conducting more virtual trainings in regular basis, it is important to study, what kind of platform would be the most suitable. This must be examined from the perspective of every stakeholder. What are the most important things from organiser's perspective, and are there some things to help the planning phase? What functionalities the trainers prefer, and how do they see that the pedagogical perspective can be implemented in different platforms. And of course, the customers opinion should be considered as well. What do they think is the most user friendly and simple platform, and what kind of functionalities they find relevant? The platforms are also developing all the time, and therefore it is likely in the future that there are more options to choose from. As noted in the results, current platforms are not designed to trainings, but more to meetings, and therefore lack the best possible functionalities from pedagogical perspective.

Another fascinating aspect of further research is the model of conducting the training courses in AQS (see appendix 8). Especially the role of the trainer in this process is interesting. For example, how engaged the trainers are to this process, and are they considering AQS more as a partner, employer, or their paying customer. How are the trainers perceiving their role in the preparation phase of the training courses, and what they feel most responsible for? Another important thing related to trainers is to find out whether they prefer classroom format or virtual format of training courses, and what kind of different skills they think are needed in each format.

It would be also interesting to make in-depth research of the role of the participants. For example, from the perspective of engagement and motivation. If there are trainings, which are kind of

mandatory, due to receive a certificate, what is the engagement level of the participants. Is there difference if the training course is voluntary and related more to participant's own interest in the topic? How much the engagement can be raised by the action of the trainer? Another thing is of course the engagement level in general. For example, does it really have effect, if the trainer or the organiser calls them beforehand, as stated in this thesis.

In general, there are many aspects to study what comes to virtual trainings. In chapter 3.1, different learning traditions were presented. It would be good to make further research based on these aspects in virtual environment more in detail. What are the most important elements to consider when designing the training courses with situative theoretical framework in virtual environment? Another perspective is, should the whole idea of situativeness be turned more into constructive and individual learning in virtual environment.

The technology is evolving all the time as noted in chapter 3.3.2. There are many techniques, which utilisation opportunities in virtual training courses should be studied on a larger scale in general. How, for example, NLP technology could be utilised in the implementation of virtual trainings or when designing them. It would also be interesting to study, what kind of technology is truly creating value what comes to improving situative learning and social participation.

In the future, the trainings are most likely regularly conducted virtually as well. Does that cause significant geographical changes to the participants in the training courses? For example, are there then more often participants only from the same area or continent in the same training course. There is no need to travel long way anymore if the training course can be done from home as well. If the participants tend to be from the same area and same cultural background, how does it effect to the value of multiculturality in a long run.

7.4 Validity and reliability

When evaluating the thesis, it is important to consider its validity and reliability as well. These concepts are mostly related to the quantitative research, but they can be used in qualitative research as well. Reliability means, that the research analysis is consistent and repeatable, so that the results are not achieved by coincidence. Validity means, that with the methods used, have been studied the relevant things. (Jyväskylän yliopisto 2021b.)

The objectives of the thesis are strongly related to the validity, because they indicate if the relevant things were studied. The aim of the thesis was to gain comprehensive information about the current situation of conducting virtual trainings in AQS. Through that information, the purpose was to create ideas how to develop the virtual trainings, and especially the learning experience in them. From these ideas, the aim was to provide suggestions for developing virtual trainings.

The objectives of the thesis were partly achieved. The expected outcomes were that AQS is aware of the benefits of virtual trainings, the trainers know how to conduct them better, and that customers attending to the training course are ensured to have a good learning experience. The focus of the thesis was mostly related to the learning experience, and the current challenges of conducting the training courses. Thus, the benefits were not studied so in detail. However, the benefits were shortly indicated through theory and the conclusions.

Another thing related to the expected outcomes is the level of concrete, as illustrated in the beginning (figure 1). It was expected that the most concrete benefit of the thesis will be for the trainers. As a concrete outcome, the instructional video and the checklist for virtual trainings were done, and they were both aimed to help the trainers. It was expected that AQS will benefit from the thesis by getting ideas of how to develop the training courses in the future. The first outcome was the suggested plan of action for the future, that aims to help in these purposes. Participants were expected to benefit indirectly from the thesis. That cannot be evaluated at this point, as the development will happen in the future.

What comes to the validity, the scope of the thesis should also be recalled. The digital opportunities were mainly focusing on the existing tools instead of the new and innovative ones. This solution was made already in the beginning because the aim was to provide suggestions to the current situation due to the sudden change caused by Covid-19. Therefore, it was not appropriate to start studying innovative tools to revolutionise the virtual trainings. The focus of the thesis related to scope is illustrated in figure 18.

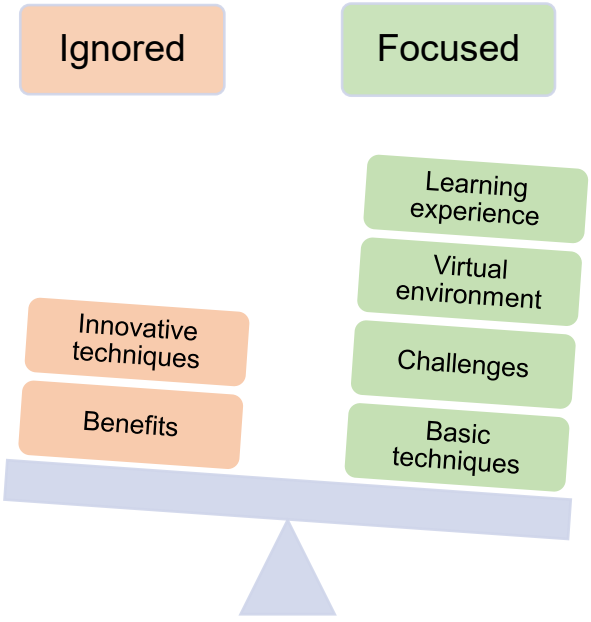

Figure 18. Focus related to scope

Another relevant thing when evaluating the validity is the methodology. The used data collection methods were well justified, and they were chosen for data triangulation to take place. The principles of case study approach were implemented well.

AQS offers training courses, which can be divided in three categories. As the company's name implies, the main category is focused on quality and safety related matters. Another category is auditor trainings, in which the focus is on enabling the participants to act as an auditor in aviation field. Third category of the training courses is related to the regulations in aviation industry. This thesis was studying three cases from two of these categories: safety and quality, and auditing. As the original purpose was to exclude the regulatory related matters from the thesis (figure 2), also the selection of the cases is well justified.

It was also a good thing, that the thesis was started from the field by participant observations. Without prior knowledge of the training courses or learning, it was impossible to know beforehand what are the most relevant things to consider. After the observations, it was clearer to what to focus on, and what kind of theoretical framework is relevant to the thesis.

What comes to reliability, the analysis is repeatable, and the different phases of the analysis are following the guidelines from the methodology related theory. The collected data was more leaning on the trainer's perspective than participants' perspective, because the interviews were more comprehensive than the content of the feedback. However, all the collected data is used in analysis and conclusions are done accordingly. The way of conducting the analysis is documented and visualised with an example (appendixes 6 and 7).

The nature of qualitative research and case study is to focus on contemporary phenomenon. The thesis was focusing on the current situation of conducting training courses in AQS. Thus, the results might differ, when repeating similar study for example in a year. However, when evaluating the validity and reliability, it can be stated that they are at a good level in this thesis.

7.5 Self-reflection and feedback

In terms of self-evaluation, it is good to clarify the cooperation with the commissioner. Communication with AQS was adequate, and they were kept informed of the progress regularly. The communication happened mostly via email.

There were three meetings with AQS during the process, and one with AQS and the thesis advisor in the very beginning. For each meeting, a PowerPoint presentation was made to present the status of the thesis process. That was also a good way of getting detailed feedback for the further

steps of the thesis. The cooperation with AQS is described in table 5, which describes the schedule of the meetings, who participated to them, and what was the topic of the meeting.

Table 5. Cooperation with AQS during the thesis process

Time	Participants	Topic
4.11.2021	AQS: Director of Operations	Objectives Expectations from AQS
2.12.2021	AQS: Director of Operations Haaga-Helia: Thesis Advisor	Kick off meeting Refinement of the objectives Upcoming participant observations
25.1.2022	AQS: Director of Operations AQS: Manager, Planning and logistic	Discussion of observations Next steps of the thesis
19.5.2022	AQS: Director of Operations	Presentation of the thesis Discussion of the results Final feedback

In the last meeting, the results of the thesis were presented and discussed. On that point, the first outcome was a preliminary development plan for redesigning virtual trainings. Redesigning virtual trainings, for example their material, would require more internal research, and financial investments. Therefore, it was agreed that instead of an actual development plan, one outcome is to present considerations for developing the virtual trainings in the future (see appendix 9).

The feedback in general was that the thesis seems to consider mostly the perspective of the trainer. It was noted that it is always valuable to get information from the different perspectives, yet there is a need for further research for other perspectives as well. As noted previously, the collected data was not so comprehensive for example from participant's side as the provided feedback was relatively short. However, one purpose was to provide concrete information for the trainers, which might explain the trainer's perspective in the thesis. Hence, it would have been important to receive feedback also from them.

When thinking about the self-reflection of the author, there are several things that are good to rise to discussion. First, as noted in the results of the thesis, time management is difficult in virtual trainings without a detailed plan. It was also difficult during the thesis process. Writing a thesis with a foreign language, proved to be surprisingly challenging and time-consuming. Thus, it would be good to allocate more time in theoretical review and writing, as the process is not simple. Neither

the theoretical framework of learning nor the case study as a research approach were familiar beforehand. Therefore, that took more time than expected.

The good things were, that the structure of the case study approach was closely followed throughout the process. The methods were very suitable for this purpose, and especially the observation was very successful experience providing comprehensive information. Another interesting thing is, that recently, there have been various trainings advertised to virtual facilitation. Hence, the topic is very current. The literature and sources related to the topic were fresh and there were recent studies related precisely to the considerations of virtual environment.

The biggest value for author's own learning was, that behind successful training session, there is plenty of planning and expertise behind, and that it requires many aspects to consider. It was very enlightening to get new knowledge about the concept of learning, which was not very familiar before the thesis. For example, how the situative approach could be implemented in training courses or what constructivist elements could be used to improve the learning experience. Learning is a very complex theme, and thus there is no correct answer for example conducting the training courses with some specific approach. However, the pedagogical principles seem to apply in all of them, and it was interesting to see, that these principles are very useful when designing the training courses.

Some of the findings were more surprising than the other. For example, the fact that there are so many basic virtual tools to be utilised to create a good learning environment. That was something, not thought before. One of the most interesting findings was related to the time. It is not so often thought, but on-site and virtual environments really are very different what comes to time. The attention span is very limited and that came to mind several times during the process. Especially when participating a meeting and noticing being distracted after a few minutes. As a participant, you must be more aware of the situation in physical environment, but it seems that as a trainer, precisely the virtual environment requires more attention.

All in all, the process has been very interesting and instructive in many ways. It has been a pleasure to be able to attend to follow the actual training situations with all the aviation professionals. Despite the current challenges related to virtual environment, the atmosphere in all the training situations was warm, professional, and understanding. Hopefully in the future, the learning experience at virtual trainings in AQS will be even smoother and engaged. Then, this thesis has been successful.

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Appendices

Appendix 1. Information Letter, example for SMS RAT course

Marjut Mäkinen **Information letter** 1 (1)

Haaga-Helia University of Applied Sciences
Master of Aviation and Tourism business

Haaga-Helia

Information regarding the Risk Analysis Training course on 15th to 17th of December

Dear participant,

My name is Marjut Mäkinen and I am studying my master's degree in Aviation and Tourism Business in Haaga-Helia University of Applied Sciences.

I am currently doing my master's thesis which purpose is to develop online training courses in Aviation Quality Services.

One of my research methods is participant observation, which means that I will take part in the upcoming RAT course. According to good research practises, it is important to inform all the participants involved.

This does not require any actions from your side. I don't use any information about the participants in this course in my thesis. I will only use this observation method as a support for the other research data.

Should you have any further questions, please don't hesitate to contact me.

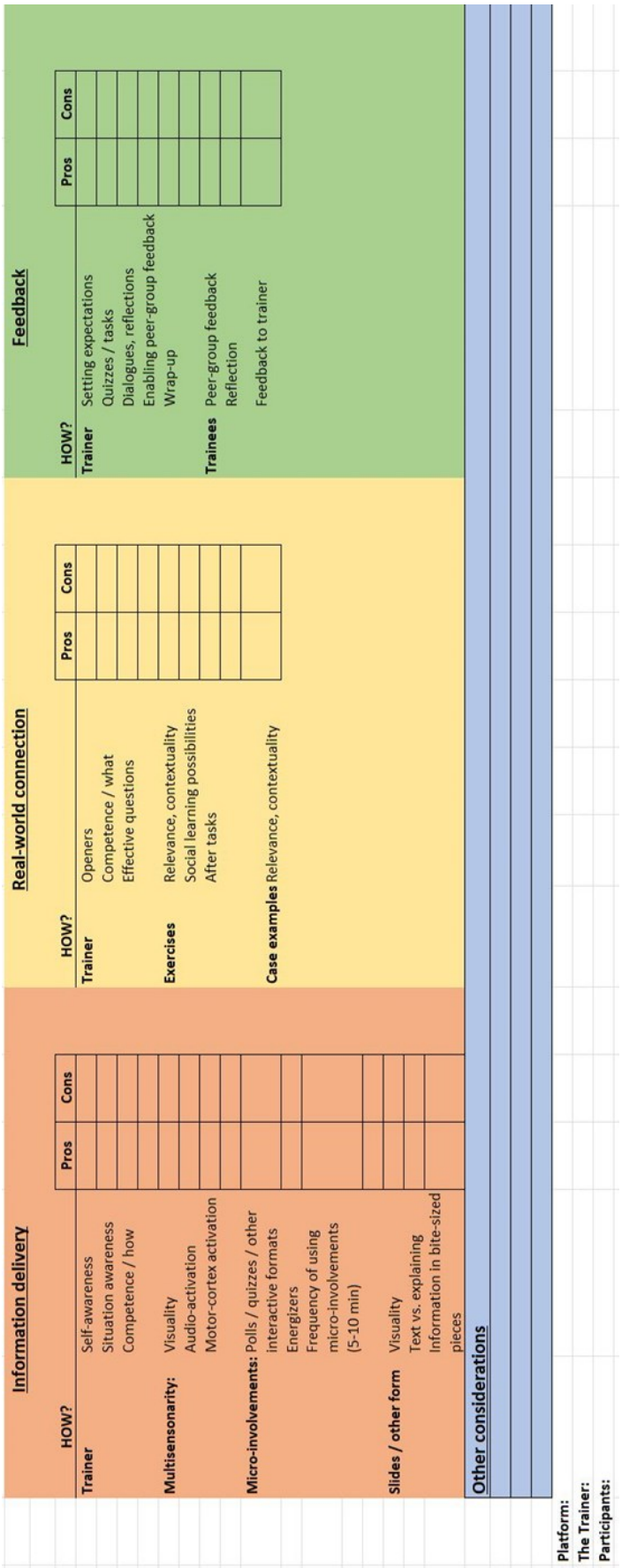
See you in December!

All the best,

Marjut Mäkinen

marjut.makinen@myy.haaga-helia.fi
+358 [redacted]

Appendix 2. Image of the template for taking notes in participant observation



Appendix 3. Expert interviews – themes and support questions for AQS personnel

These interview themes and support questions are meant to guide free discussion with the interviewees. This frame is designed in accordance with the research questions of the thesis. The interview contains four themes, and on behalf of AQS, the Director of Operations and the Manager of Planning and Coordinating are interviewed.

1. General information
    - Tell me about yourself, what is your professional background?
    - How long have you been working in Aviation industry? And what about AQS?
    - What is your main area of expertise?
    - What is your role what comes to trainings in AQS?

2. Training process
    - Describe the trainings in AQS.
    - What are the core elements to ensuring that AQS has the best possible trainings?
    - Describe the process for organising the training session. What role AQS has in terms of planning, preparing, conducting, and evaluating each training session? Are there differences between different trainings?
    - What kind of experience, if any, AQS had from virtual trainings before covid-19 pandemic? Have the virtual trainings ever been in consideration before the pandemic?

    - What are the biggest challenges in virtual format compared to on-site trainings?
    - What are the biggest benefits in virtual format compared to on-site trainings?
    - The digital transformation of the training courses in AQS happened quite rapidly due to Covid-19 pandemic. When you look at the process now, what has succeeded very well? And what there would be to develop?
    - Have the trainings and the training material been evaluated during this pandemic time? Have they been improved? If yes, how?
    - How do you see the future of virtual trainings?

3. Customer experience in virtual trainings
    - How well do you know your customers who are attending to the trainings? For example, what kind of professional background they have, or why they are willing to attend to the training.
    - How do you communicate with your customers?
    - What does online training require from participants, and how have they been instructed in advance?
    - Is there some technical support available before and/or during the training?
    - Describe the process of evaluating each training course?
    - Has there been some feedback from customers related to the virtual format of the trainings? If yes, what are the main areas it is related?
    - How AQS adds value for customers in terms of the customer journey of the training?

4. Cooperation with the trainers
    - Describe the roles between AQS and the trainers during the training process.
    - How do you communicate with the trainers (before/during/after each training session)?
    - Have you offered some trainings or workshops for the trainers for what to consider when conducting virtual trainings? If yes, what has been the main content?
    - What kind of (technical) support is available for the trainers?
    - How is the content of each training customized or updated? Does it happen by the trainers, or with the trainers?

Appendix 4. Expert interviews – themes and support questions for trainers

The interview themes and support questions are meant to guide free discussion with the interviewees. This frame is designed in accordance with the research questions of the thesis and the interview contains four themes.

1. General information

- Tell me about yourself, what is your professional background?
- What is your main area of expertise?
- How long have you been working in Aviation industry? And as a trainer?
- Describe the word *Training* with few words.

2. Training session, methods, and practices

- Describe the role of the *trainer*. Does the role vary during the training session and/or depending on the training format?
- How much time do you spend preparing for virtual trainings compared to on-site trainings?
- Is there a difference in preparation time and if so, why?
- What kind of training methods do you prefer as trainer? Why?
- How do you modify these methods to virtual training?
- Are there some methods you often use for on-site trainings, but you can't use virtually? If so, why?
- What training platform do you prefer and why?
- How do you utilize technology in your virtual training sessions?
- How do you usually activate the participants along the virtual training session?
- What are the best practices to enable collaborative learning during the virtual trainings?
- How relevant it is to know the backgrounds of the participants to be able to connect the training content into real world? What practices there are to create the real-world connection?
- How do you ensure that participants have understood the core content of the training?
- What kind of opportunities do participants have to recap the content of each training day by themselves (for example homework for the next training day)?

3. Customer experience in virtual trainings

- Are there some ground rules during the training sessions, for example how to use the cameras or request the floor? How do you agree these rules with the participants?
- What does virtual training require from participants, and how have they been instructed in advance?
- How do you act if participants have some technical issues? Is there technical support available?
- How do you consider your physical presence during the virtual training session?
- How do you strive to provide the best possible training experience for the participants? What is the most important thing to consider?
- Has there been some feedback from customers related to the virtual format of the trainings? If yes, what are the main areas it is related?

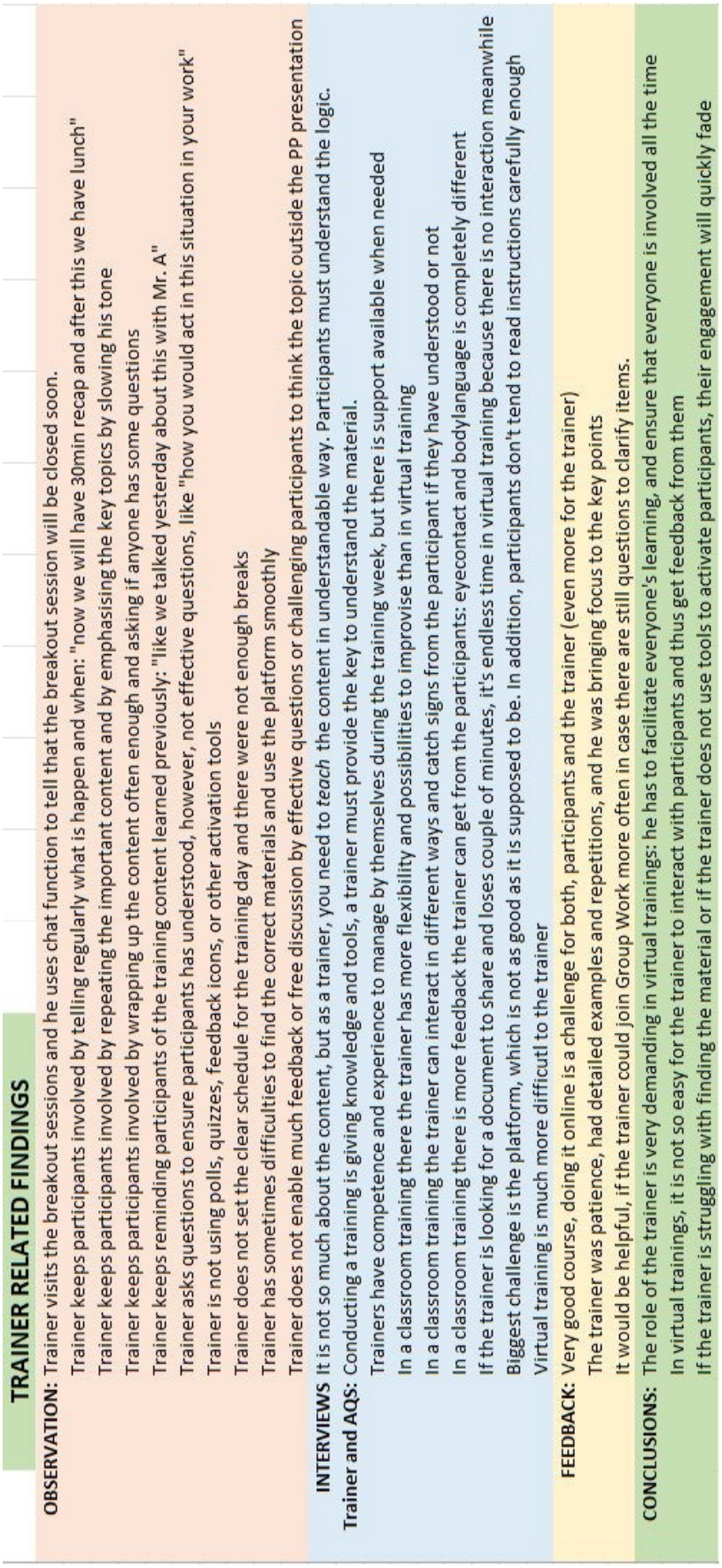
4. Cooperation with AQS and the potential of virtual trainings

- Describe the roles between you and AQS during the training process.
- How do you communicate with AQS (before/during/after each training session)?
- The digital transformation of the training courses in AQS happened quite rapidly due to Covid-19 pandemic. When you look at the process now, what has succeeded very well? And what there would be to develop?
- Have you received some guidance on how to facilitate virtual trainings? If yes, what kind of?
- In general, what are the main challenges for virtual trainings compared to on-site trainings?
- What are the benefits for organising virtual trainings?
- How do you see the future of virtual trainings?

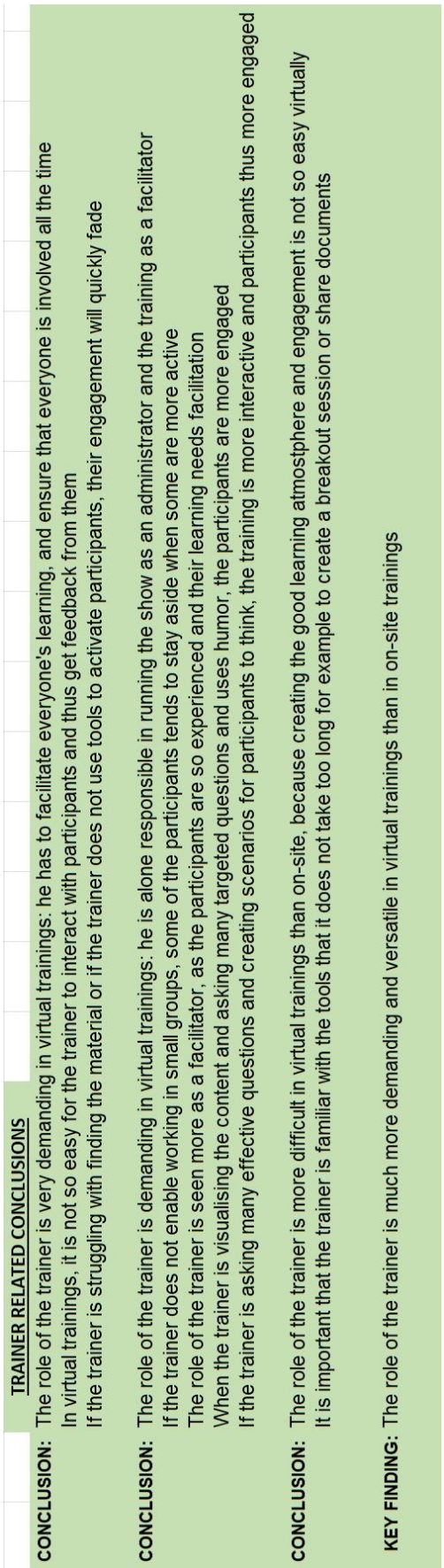
Appendix 5. The table of documentation of the cases

CASE I	CASE II	CASE III
Aviation Auditor Training **(AAT)**	Safety Management System Complete Training **(SMS Complete)**	Safety Management System Risk Assessment Training **(SMS RAT)**
Duration 13th – 17th of December 2021	**Duration** 13th – 17th of December 2021	**Duration** 15th – 17th of December 2021
Participants: 16 + 1	**Participants**: 8 + 1	**Participants:** 8 + 1
Platform: Zoom	**Platform**: Zoom	**Platform**: GoToTraining
Observation 15th of December 2021, 9.00 - 15.30 (UTC+1) Notes: handwritten, photos and voice records	**Observation** 16th of December 2021, 9.30 - 16.00 (UTC+1) Notes: handwritten, photos and voice records	**Observation** 17th of December 2021, 9.00 - 13.20 (UTC+1) Notes: handwritten, photos and voice records
Interview, Teams 18th of February 2022, 19.00 - 20.30 (UTC+1) Notes: Recorded Teams meeting, afterwards transcribed	**Interview, Teams** 21st of February 2022, 18.00 - 19.30 (UTC+1) Notes: written and voice record summary, afterwards transcribed	**Interview, Teams** 25th of February 2022, 12.00 - 13.00 (UTC+1) Notes: written and voice record summary, afterwards transcribed
Archival Records Customer feedback, qualitative Number of people provided feedback: 16	**Archival Records** Customer feedback, qualitative Number of people provided feedback: 8	**Archival Records** Customer feedback, qualitative Number of people provided feedback: 7

Appendix 6. Analysis example of the pattern matching in one case, topic: “trainer”



Appendix 7. Analysis example of the cross-case synthesis related to the topic "trainer"



TRAINER RELATED CONCLUSIONS

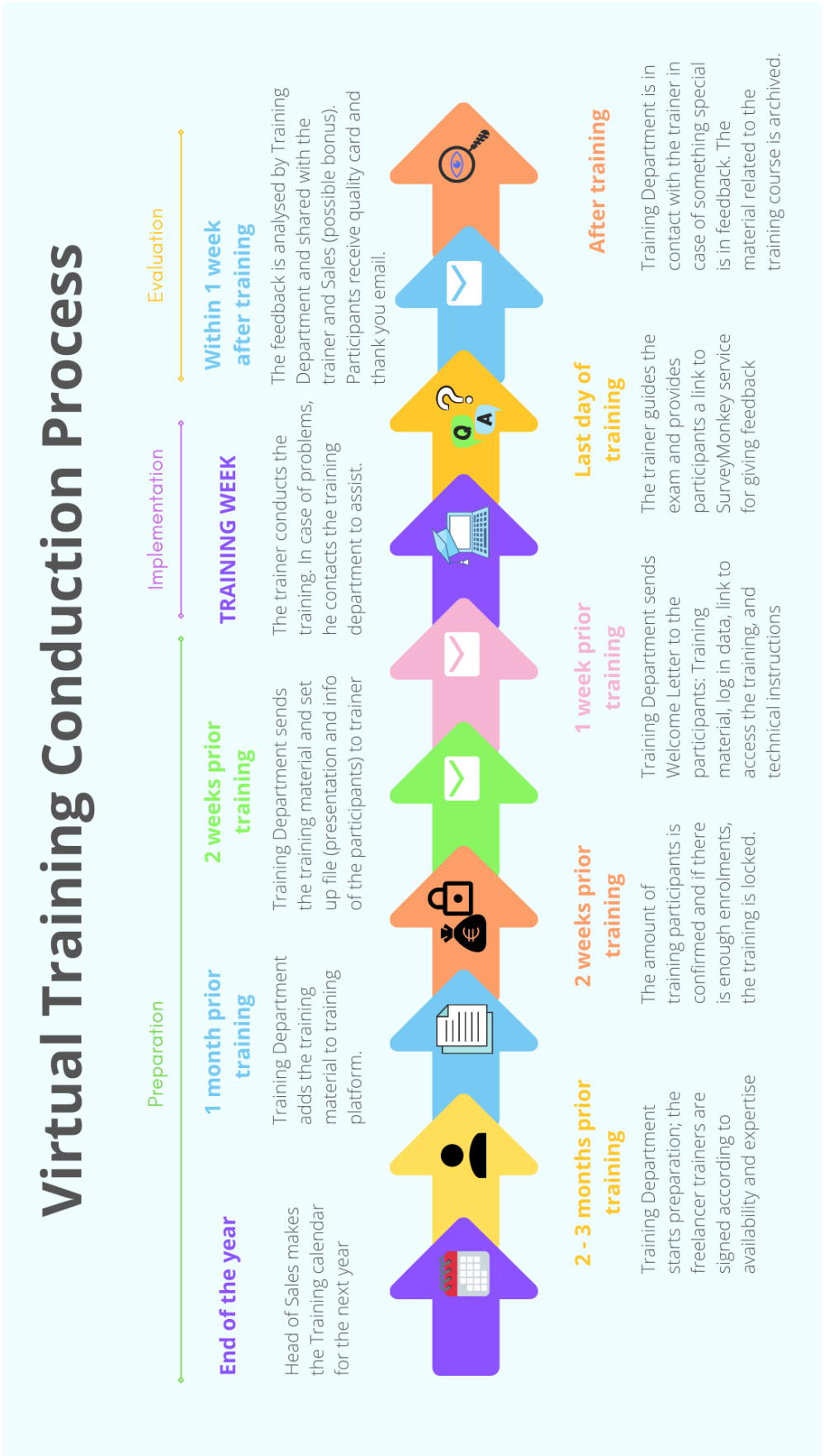
CONCLUSION: The role of the trainer is very demanding in virtual trainings: he has to facilitate everyone's learning, and ensure that everyone is involved all the time
In virtual trainings, it is not so easy for the trainer to interact with participants and thus get feedback from them
If the trainer is struggling with finding the material or if the trainer does not use tools to activate participants, their engagement will quickly fade

CONCLUSION: The role of the trainer is demanding in virtual trainings: he is alone responsible in running the show as an administrator and the training as a facilitator
If the trainer does not enable working in small groups, some of the participants tends to stay aside when some are more active
The role of the trainer is seen more as a facilitator, as the participants are so experienced and their learning needs facilitation
When the trainer is visualising the content and asking many targeted questions and uses humor, the participants are more engaged
If the trainer is asking many effective questions and creating scenarios for participants to think, the training is more interactive and participants thus more engaged

CONCLUSION: The role of the trainer is more difficult in virtual trainings than on-site, because creating the good learning atmostphere and engagement is not so easy virtually
It is important that the trainer is familiar with the tools that it does not take too long for example to create a breakout session or share documents

KEY FINDING: The role of the trainer is much more demanding and versatile in virtual trainings than in on-site trainings

Appendix 8. Virtual Training Conduction Process



Appendix 9. Considerations for further development of virtual training courses in AQS

SHORT TERM CONSIDERATIONS

It is important to consider the challenges raised in this thesis, related to technology, communication, and virtual environment. Related to these challenges:

1. DISCUSS about the results of the thesis internally
- Are there some elements in your other trainings, which are suitable for virtual environment regarding to the results? Are these elements implementable to all training courses?
- How to strengthen the uniformity of the training courses in terms of technology? Is it possible to stabilise the usage of one virtual platform? Is it possible to redesign the exercises to be done with other tools, more suitable to virtual environment?
- How the training conduction process could be improved to response the needs of virtual trainings?
- What could be done to add value for the customers and increase their engagement in the training course? For example, it possible to introduce the trainer of the course already in enrolment phase?
- How the participants could be activated more during the virtual training session?
- How current pedagogical elements could be fully transported to the virtual environment?

2. COOPERATE with the trainers, arrange a workshop or a shorter meeting
- Do the trainers need some training or support from AQS's side related to virtual environment? Does AQS need some further information about the training courses so that they would become more uniform?
- How the gaps in the conduction process could be narrowed?
- Is it possible, that the trainers would design their own presentation to the training courses in addition to provided handout, considering the requirements in virtual environment?

3. START moving towards development of the virtual training courses
- Agree the plan of actions with proper resources

CONSIDERATIONS FOR LONGER TERM AND STRATEGICAL PLANNING

All development requires strategical choices and analysing the business environment with its risks and opportunities. Therefore, it is important to consider different aspects also in long-term planning. Here are three suggestions:

1. BUSINESS ANALYSIS. As noted earlier, it is important to conduct a comprehensive business analysis that takes into account all the aspects related to the development of the training courses in AQS.

2. PROTOTYPE OF VIRTUAL TRAINING COURSE. Consider of creating a prototype of the future virtual training course, for example by utilising action research methods. In cooperation with the trainers, redesign the training material to be more interactive and simulative, and redesign the structure of the training to include more small group activities and co-creation. Collect comprehensive feedback from the customers and the trainers and refine the prototype accordingly.

3. CONSIDER TECHNOLOGY ON A WIDER SCALE. Explore what technologies AQS could generally use to optimise the usage of resources and internal and external communication (Robotic Process Automation, AI, or Natural Language Processing for example in a form of a chatbot). There are plenty of digital opportunities to utilise to make different business processes more fluent. Applicable technology is a very important competitive advantage, and a necessity for the business in the future.

Appendix 10. Instructional video

Content:

0:00 Start, purpose of the video

1:02 Target Group

1:20 Foreword: Pedagogy and technology

4:20 Designing the training course

5:08 Purpose

5:53 Technology

8:03 Training material

10:19 Roles

13:12 Implementation

13: 33 Beginning

15:50 Balanced timing

18:36 The trainer

20:59 Evaluation

21:12 Feedback

21:07 Disclaimer and further information

22:46 End

The instructional video can be found behind the link:

https://video.haaga-helia.fi/media/Conducting+Training+Courses+in+Virtual+Environment/0_lof86r8l

Appendix 11. Checklist for Virtual Trainings

Virtual Training Checklist

PREPARATION

Training material

- [ ] Handout
- [ ] Presentation

Exercises

- [ ] Tools for exercises
- [ ] Amount of exercisees
- [ ] Instructions for exercises

Training platform

- [ ] Functionalities
- [ ] Accessibility

Communication

- [ ] Internal; preparation, set up
- [ ] External; customer engagement

DEFINE THE ROLES

- [ ] Training Department
- [ ] Sales Department
- [ ] Trainer
- [ ] Participants

PEDAGOGICAL PRINCIPLES

- [ ] Engagement
- [ ] Interactivity
- [ ] Activity
- [ ] Feedback
- [ ] Contextuality

VIRTUAL ENVIRONMENT

Micro-involvements

- [ ] Polls
- [ ] Quizzes
- [ ] Activities in small groups

Multisensonarity

- [ ] Visuality
- [ ] Motor-cortex activation
- [ ] Audio-activation

Other elements

- [ ]
- [ ]

Consider **HOW** each element is realised in virtual trainings. When it is clear, mark as checked!