UNIVERSITY OF AGDER

Investigative decision making: the use of storytelling in e-learning for training police students

Olha Antoniv

Supervisor: Derek Woodgate

Aleksandra Lazareva

This master's thesis is carried out as part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.

Preface

Purpose

– "E-learning is not intended to replace the traditional classroom setting, but to provide new opportunities for interaction and communication between students and instructor or teacher" (Zhang *et al*., 2004). The thesis aimed at discussing this phrase as the major problem statement.

Design/methodology/approach

– For this research, case study research method with the Instructional Design (ID) process was the chosen design and method for designing and consequently developing an e-learning solution. The case study research method with the ID process was found to support the design and development of a successful e-learning course for Police students.

– The study investigated whether police high school students can experience the impact on learning outcomes and were motivated and engaged by interacting with an e-learning. Implementation of digital storytelling approach was projected to increase the learner performance and motivation.

Findings

– The development of an e-learning course integrated with digital storytelling helped students to understand better the case-task content. Uses of interactive content increases and enhances students' motivation in their learning process and provide better understanding of the case-task content/context.

– Visual aids lead to better understanding of the whole content/context that affects the learning performance when compared to standard classroom methods, either as a complete substitution or a supplementary solution.

Keywords: *E-Learning*, *Digital storytelling*, *interactive-created content*, *case study*, *police cadet*, *student-engagement*, *student motivation*, *Technology Acceptance Model*

Acknowledgment

The last five years at the University of Agder was very interesting and exciting for me. Through these years, I learned many exciting things, including the appreciation of various interesting topics, contributing to my personal development. I could not manage all these on my own, but rather with the help of my family, peers, and professors. In this regards, I sincerely express my gratitude and appreciation to Dr. Ivar Fashing for good cooperation and his time before and during the process of this study. More so, I would like to thank him for organizing my research with police student at Police High School as well as his invaluable support in other research areas.

I would also like to say thank to my supervisor, Derek Woodgate, for his time, to be always available for consultations and discussions at any time. He always gives me good advises support and quick feedback. Also, I will like to thank Aleksandra Lazareva, for the excellent and useful feedback.

I want to say thank you to the Ghislain Maurice Norbert Isabwe for having time to be involved in my project and giving me good advises about my project when I needed it.

Furthermore, big thank you to Morgan Konnestad for always being for the students and helping them in various problems when necessary. For all these years at University, it was still nice to visit him and talk about the problem we had. Thank for being patient with the students for all these years.

Finally, my thanks go to my best friend, Anette Hjelle, for one year ago we started to write our master thesis together, because of my pregnancy, I had to stop my writing. Importantly, she supported me a lot, creating the best environment for me to have a fantastic time at the University.

Olha Antoniv

Grimstad, 2019

List of Figures

List of Tables

List of Abbreviations

PHS Police High school

DST Digital storytelling

LMS learning management system

ID Instructional Design

TAM Technology acceptance model

Contents

1 Introduction

1.1 General introduction

Annually, the police in Norway receive about 1,800 messages about missing persons. Most of the cases are resolved, but in 461 missing cases over the past 20 years, the police still have no answers. The Norwegian case is unfortunately not unique, in the European Union (EU) the police records 250,000 cases of children missing per year with a similar unsolved rate. The 250,000 reported cases of missing children every year in the EU translates to one child after every 2 minutes (European Commission (EC), 2013). Cases of missing children include various types of disappearances such as runaways, criminal abductions, and lost and parental abductions, among others. All these cases require the police to conduct investigations to find the missing child and ensure justice is given to the child. Notably, in criminal investigation, biased decision-making often results in poor investigations or may impede the progress of getting justice (Fahsing & Ask, 2016).

The investigation of missing persons requires that the police must demonstrate special competences, which demands the police officers to generate a multitude of scenarios linked to the evanescence of the missing person. Today, such police deduction skills are taught in the classroom in the pure traditional sense (Cassidy, 2004). There are various issues that have been raised concerning the capacity and capability of the police to effectively use investigative skills they acquire from the classroom, with respect to the nature of teaching they undergo amidst the technological changes and advancements in teaching methods in investigative skills in various parts of the world (McDermott & Hulse, 2012; Sparrow, 2015). Therefore, inasmuch as the use of traditional teaching methods has been successfully used to train the police, there are better opportunities offered by the technological advancements that can be exploited to improve on the performance of the Norwegian police in finding missing persons. Consequently, this master thesis investigates the benefits of e-learning solution compared to traditional learning approaches that police officers receive during their academy training. More, specifically, this thesis investigates how digital storytelling enhances the decision-making skills of a cadet police officer compared to standard classroom methods when faced with a missing person case.

The subject of this thesis is of interest and importance for society as a whole, where improving the teaching of police cadet would eventually increase the recovery rate of missing persons and

ultimately saves lives of the people. With regards to the rapid development and advances of technology in the world, teachers and learners have learned to appreciate online instruction as one of the emerging and alternative modes of teaching and learning; as well as being a substantial supplement classroom or traditional education. Further, online training has become one of the favorite ways of teaching and learning where various colleges or universities, as well as individual companies, consider offering their training or some courses on the online platform (Koper, Lum, & Willis, 2014). Similarly, despite the increasing awareness and popularity of online courses, the conventional (traditional/classroom) training has been fighting back with the proponents of the traditional training investing new methods and ways to retain the interest of learners are trainers. For some people, e-learning or online training is considered to be appropriate; on the other hand, some people consider classroom training to the best approach in the delivery of learning or teaching content (De, 2018). Notably, online training offers some of the best opportunities for the learners and teachers to appreciate their straights as well as weaknesses; acting as mentors while also guiding their peers in their respective career possibilities (Bell & Federman, 2013; Kibria, 2014). Therefore, in this thesis, the e-learning solution is examined in connection with training in police decision-making at police high school. It is developed, tested and evaluated, which is available for police students, the e-learning solution will help increase student's learning performance, interactive content will motivate and enhance the learning experience of investigative decision making. The outcome of this thesis, to develop e-learning with the implementation of digital storytelling offers an interactive visual representation of the case-task.

1.2 Research background

Globalization, technological development and changing population patterns, all create new demands on the police. Due to the lack of expertise, thousands of different criminal cases in Norway are dropped. To decrease the dropping rate of police case, the police must also evolve. New forms of crime must meet with increased specialization and professional competence that can be taught efficiently trough eLearning. Many types of eLearning solutions can be created with advanced development tools, tailored to the needs of, in our case police students. Making the right choice of e-learning methods totally relies upon the proper need analysis of any educational organization as well as upon the nature of education or training. In this case study, digital-storytelling was considered appropriate to the student's needs, considering the provisions and opportunities that technology give to the learners in accessing e-learning

methods. In this context, the task-skills provide essential pillars for provision of support to the critical thinking-skills of offence validation including the theory development for possible development of effective investigative plans that are aimed at forming reasonable basis and grounds for belief. Equally, for this thesis, the performance criteria for criminal investigative decision making was considered to include: knowledge acquisition of the overall process, reflection, analysis and application of the principles; understanding of the multiple variables potentially involved in missing person cases and the police's ability to respond and solve, through better and quicker decision-making. Furthermore, it is extremely important to consider any nature of training adopted for the cadet or the education approach and experience they gain does not really matter (Race, 2013); what really matters is that the learners must feel the learning. Also, there is no single recommended way in which teaching should be carried out; otherwise, learners would report boredom from a single approach to learning if all teachers adopt a similar approach to teaching. Nevertheless, irrespective of the teaching approaches adopted for use, what really matters is how the teaching method chosen impacts on the learning of the learners.

In effective learning, Race (2013, p. 6) indicates that "getting people to think of anything they have learned successfully is a positive start to alerting them to the ways in which they learn". This implies that successful learning experience of the individual learners is about feelings. Therefore, this study focuses on introducing a teaching and learning approach that would improve the overall feeling of the learners including individual learners' acceptance investigation for the online learning in their respective universities as an effective learning method and tool. Since the millenniums, the main component of society (Maiers, 2017), is a projection that can be equated with society. In Norway and in the world as a whole, the use of technology in their learning would therefore improve their overall experience, their cognitive skills and thus improve their decision-making processes and reflective skills. The results from their study showed that the use of technology in the final year of the Norwegian police students training improved their general decision-making and communication (Phelps *et al.*, 2016, p.50). Implementation digital storytelling approach increases the performances at police officers.
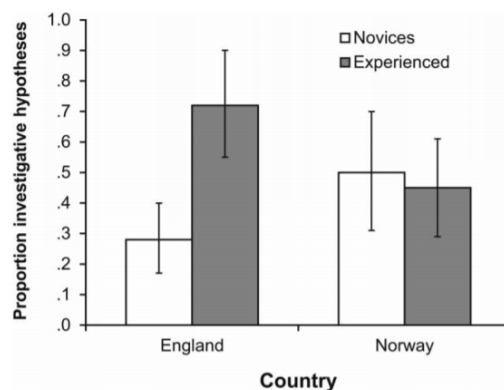
Figure 1: Differences between English and Norwegian police (Fahsing & Ask, 2016)

1.3 Teaching program

The curriculum for students B1[1] and B3 [2] (Attachment), the two years the students attend school. The 2nd year they are out in practice in a police district. When it comes to further education in investigations (the VEF[3] study), this is a further education study that they take after they have finished their bachelor's degree and worked as an investigator for a while. One does not have to be in a master's program to take this degree. Today, different methods are used when it comes to learning among the police students at PHS. Most of the PHS in Norway still uses the traditional classroom learning methods when it's come to investigation education. Chapters in the research theory book indicate similarities in the curriculum in both 1 and 3 bachelor degree class, just different chapters in the various years. The students cannot bring the book to the exam; the theory from the textbook is the basis for the tasks at the exam.

Currently, the Police High School (PHS) uses the Canvas[4] learning platform. This learning platform helps students to have access to all the necessary information that students need, such as current media issues, circulars and other important information. Use of e-learning present the disclosure of different form of quiz (which includes the curriculum), various video lessons, handing over the curriculum lecture using video, PHS using instructional videos and sample videos, showing how "things" can be accomplished. We have an entire subject, training in BL (basic solutions), which is the case processing system for criminal cases, which is now done digitally. Here the students can go in and watch the video and hear / see the teacher explain,

---

[1] Bachelor students 1 year
[2] Bachelor students 2 year
[3] VEF- Studie i videreutdanning i etterforskning
[4] www.canvas.instructure.com

while sitting with the system up and trying out themselves. Everything was put through in regular classroom teaching.

1.4 Problem statement

Generally speaking, the teaching of criminal investigation is still undertaken by using more traditional learning methods, commonly in a classroom setting. A criminal investigation is one of the complexes, multidimensional, problem-solving challenges (Scott, 2003). In that regard, the police need to appreciate various investigative processes that allows them develop investigative plans, which prioritize responses, and optimize decision making. This requires training in a high level of training and the learning of structured practices for tactical and carefully designed investigative response and strategic critical investigative thinking. However, despite improved learning methods and support literature, certain cases such as missing persons are increasing every year and are proving more complex to investigate and solve (ICRC, 2003). The objective of this thesis is therefore to establish new methodology for increasing the student's motivation by using e-learning with implementation of digital storytelling and the decision-making performance of police officers dealing with missing persons by effectively improving the criminal investigative decision-making process. The main requirement, to develop e-learning with the implementation of digital storytelling some will enhance decision-making skills and motivating police officers for better learning performance with interactive content. With e-learning, education, and teaching, students will appreciate, develop and increase their personal understanding of their respective areas of learning and thereby experience a successful learning. Moreover, e-learning course with interactive content (e-learning) vs print content (book) are motivating and engages students when investigative decision-making process state.

1.5 Research questions

RQ1: How does digital storytelling improve the learning performance for police students, and could it be used as a complete substitution or a supplementary solution for standard classroom training?

RQ2: How does digital storytelling as an approach, augment and advance the motivation and enhance the learning experience of investigative decision making?

1.6 Previous research in the field

Due to fast-paced technological environments, the implementation of technology in recent years has been an important consideration in regard to education. Many academic institutions and teachers have considered how e-learning and other forms of technology, such as digital storytelling, can enhance the classroom. Moreover, this has sparked the interest of researchers who are looking to determine whether the implementation of technology is able to supplement classrooms by boosting motivation and learning. Phelps, Strype, Le Bellu, Lahlou and Aandal (2016) investigated the outcome of experiential learning and training based on simulation in the police education system in Norway. A body-worn video (subcams) and replays of interviews video footage used as a tool that could encourage reflection amongst Norwegian police students. Results from the study indicate that the use of technology in the final year of the Norwegian police students training improved their general decision-making and communication (Phelps *et al*., 2016, p.50). Similarly, Lisenbee and Ford (2018) provides a checklist for selection of various book lists, stories and storytelling websites where students are engaged in both traditional as well as digital storytelling to help make connections between the effectiveness if the learning approaches and the experience of the learners. Also, McGee (2014) discusses how increasing criticism on the police interactions in investigative work requires consideration of digital storytelling as strategies for improvement of performance, motivations and interests of the police cadets in their investigative work.

Sadik (2008) undertook a study that focused on the implementation of digital storytelling in the classroom, aiming to engage students and make them motivated to learn. This study was performed in Egypt in which the professors would create digital stories for specific lesson plans they were required to teach. This made the lessons more creative and proved that teachers were also willing to put in more effort to help students. Heo (2009) conducted a similar experiment in which he determined that digital storytelling significantly aided teachers in connecting with their students. In his research study, he observed classrooms that were able to implement technology into more traditional settings. Both of these instances are perfect examples of how a given technological tool can be used as a powerful delivery tool when learning. Neither academic environment found that technology was distracting or hindered growth. Moreover, digital storytelling, if well-positioned, can take advantage of the important user-contributed content and thereby help trainers and learners to overcome various obstacles that are related to productivity in using the technology in their traditional learning environments (Robin, 2008).

More specifically, researcher Jim Leal (2009) decided to put this research into a more defined niche by exploring online learning in law enforcement. Students who are involved in law studies are often required to go through a lot of schooling which takes many years. However, it is possible that this time may be shortened by the implementation of online learning, allowing students to learn and complete tasks on their own time. He determined that, in 2005, 3.2 million learners were involved in online learning (Leal, 2009). This has only increased since then. His results demonstrated that technology helped to facilitate learning because the generation involved in the study of law was made up of the millennial generation which depends on technology.

Tamim, Bernard, Borokhovski, Abrami and Schmid (2011) conducted research to determine how online learning helped to overcome various educational barriers. For example, certain people may not have access to equal education due to distance. Online learning can completely solve this because it allows students to use technology and the internet to communicate with people around the world. Therefore, they are able to enroll in classes that may not be nearby to where they live, which makes location no longer an issue. Hsu, Hwang and Chang (2013) states that daily classroom activities often involve the use of computers, printers, multimedia and other different forms of communication, which is why many academic institutions have been able to use these to their advantage in order to help students. When everyone is on the same page and can use communication in similar ways, this can, according to Pitler (2006), increase achievement, understanding and critical thinking skills.

Alternatively, researchers Sun *et al*. (2008) sought to determine whether there were any negative aspects to online learning, hoping to determine how these issues could be fixed. They wanted to see whether there were certain factors that were turn-offs when implementing technology or any negative sentiments that were created. They discovered that students who were discouraged from participating in e-learning stated that this was because the platforms were difficult to use, there was anxiety surrounding online platforms and there was not enough diversity. Consequently, Sun *et al*. (2008) then proposed a model in which these problems could be solved now that they were identified by showing institutions how to strengthen their online learning platforms. Since then, learning technologies have advanced significantly.

There are major advances that have been undertaken in the police training in Norway and other jurisdictions in the recent past. Notably, several countries have adopted e-learning as one of the common ways through which their training courses and contents are delivered to the police officers. The use of e-learning has been projected to supplement the traditional classrooms as well as gymnasiums which have been extensively adopted for training such as in Canadian

Police Knowledge Network (CPKN). Between 2007 and 2008, Canadian officers completed about 8,100 online training courses on various topics ranging from awareness on explosives to management of fatigue (CPKN, 2009). Moreover, there has been the use of computer-based simulations in the training of the police officers to improve their standard of performance in different conditions (Bennel *et al*., 2010), complex multi-agency incidences and driving exercises (Ross, 2009).

It is highly likely that the increase in some changes to the practice in education such as e-learning (opens and distance education), has resulted from the integration of internet with the computers (Tamim *et al*., 2011). In the present school environment, technology has been used in the schools by teachers to undertake various activities such as scanners, printers, computers and the internet in calculations, processing of examinations and communicating with their peers (Hsu *et al*., 2013). Furthermore, Pitler (2006) argues that "Applied effectively technology not only increases students' learning, understanding, and achievement, but also augments their motivation to learn, encourages collaborative learning, and develops critical thinking and problem-solving strategies". Therefore, there is need to give attention to possible integration of technology in police learning and investigations (Sadik, 2008). In addition to eLearning, the police training programs and academy instruction are including a high level of gamification, serious games, mixed reality 3D video studio VR set ups as well as immersive 3D world simulation (Al-Qahtani & Higgins, 2013; BinSubaih, Maddock & Romano, 2009). Smeda, Dakich and Sharda (2014) investigated the effectiveness of application of digital storytelling in the traditional (classroom) teaching; whereby, the results show that digital storytelling is one of the powerful tools that should be integrated as a tool of learning. Thus, instructional messages that has learning activities should be considered in this case for possible creation of exciting and engaging learning environments (Smeda *et al*., 2014). The overall importance of digital storytelling as an approach can potentially enhance the engagement of learners as well as provide better education outcomes for the intended learners (Al-Qahtani & Higgins, 2013; Smeda *et al*., 2014).

1.7 Limitation of the research

Being a case study, this research has potential limitations. One limitation is the small sample size used in the survey as the participants for e-learning testing. Technology limitation: the first part of technology limitations took place when the authoring tool should be chosen. The University of Agder had the license for Captivate program, which took an amount of extra time

for developing of the e-learning course. The program was complicated to learn and had some limitations on functionality. Other authoring tools program was not available during this project period. Second technology limitation: Police High School uses the LMS Platform Canvas[5]. It was intended to place the course content and convert the e-learning module on the school's LMS Platform. Because of the limitations that arise through the development process from the school's side, it was not possible to do that. Based on the specification requirements, the choice was, that the link 1 to the e-learning module should be placed in the web page (mentioned down), which was provide by the Uia's web server. Participants go to the webpage where the link to the module was provided. In terms of timing limitations, in the begging of this project, it was planned that data collection would involve interview of participants during this research process, but because of time limitations it was not possible. It was given only one-hour time for the whole research process.

1.8 Thesis outline

This thesis is divided into various chapters, where each chapter presents different but leading information that builds upon one another. In **Chapter One** (Introduction), the general introduction, research background, problem statement, research questions, previous research findings and the study limitations are presented. In **Chapter Two** (Theory), the learning theories are discussed as well as critical review of literature on various educational tools are provided. **Chapter Three** (Instructional Design) presents the instructional model and the development. **Chapter Four** (Research Design) presents the participants and selection criteria, data gathering process, procedure for data collection, analyses for the research as well as the reliability, validity and limitations. Further, **Chapter Five** (Results), the results that were collected, analyzed, interpreted and reported are presented. Also, **Chapter Six** (Discussion) presents the discussion of the results, where both learning performance and motivation of integrating digital storytelling are analyzed and discussed. Lastly, **Chapter Seven** (Conclusion) presents the conclusions that were made from the study as well as the opportunities for future work.

---

[5] www.canvas.instructure.com

2 Theory

In order to develop necessary fundamentals framework for research, it is important to examine previous relevant studies to see how the researchers used knowledge to develop studies and answer their hypotheses. This chapter explores in detail, aspects involving e-learning in the classroom by drawing upon existing research in this arena. This includes addressing different learning theories and styles, motivation, andragogy and critical thinking skills. Further, this chapter explores how e-learning can be utilized in the classroom and whether it has been previously found to enhance learning and motivation. In other words, a solid knowledge regarding definitions of terms, how previous studies were employed and what this means for the hypotheses of this particular study are all presented. Furthermore, various issues involved in the e-learning, such as online courses, digital storytelling and the implementation of various forms of technology in accordance with traditional forms of teaching, are all considered.

2.1   Learning theories

2.1.1 Pedagogical approaches in online education and training

Learning theory outlines how various persons learn, including the absorption of knowledge as well as its retainment. Also, it outlines how various emotions and behaviors are connected to the ability to learn new material (Khalil & Elkhider, 2016). Students across the globe have unique ways of learning, which is why it is important to identify these differences in order to determine the most successful way of teaching in the classroom. Notably, learning theories are categorized into two broad schools of thought; the Behavioralist and Cognitive schools (Race, 2001; Weegar & Pacis, 2012). The two schools of thought are further summarized by Race (2001) who believed that an individual learn based on a process beginning with a stimulus, then response, and lastly a reward; which are thus considered to be the Pavlovian view. This suggests that repetition will also come into play because when students are able to connect certain behaviors with various outcomes, they will look for patterns so they can yield the results they are looking for.

Stimulus is achieved through an input, whereas the out in the process is referred to as the learned behavior. Several incentives have been developed for learning something, whereby the "reward" is meant to help the learner perceive the benefits of learning through passing of an

examination, acquiring the right qualifications to obtain a certificate and thereby becoming a professional (Race, 2001).

Unlike the behavioralist school of thought on learning, Cognitive school holds that people acquire knowledge from experience (Race, 2001). Therefore learning takes place beginning with the experience that some has and fits into the framework of already gained or an existing knowledge (Weegar & Pacis, 2012). Learners are able to be more effective in the process of learning in what is considered as "deep learning" instead of "small learning" (Scott *et al*., 2014). That can only be achieved through active learning and not just the passive approach to learning (Scott *et al*., 2014). For example, students take a more effective and active role in their individual learning, indicating the benefits of the implementation of active learning (Aksit, Niemi & Nevgi, 2016). Furthermore, the experiential learning, which involves learning by doing (Aksit *et al*., 2016) is considered to be more effective process of learning through learning by reading or in some cases by (more information on Fig. 2). When learning is by doing, it offers the learners the best opportunity for remembering the information they have recived as well as allowing them to digest and process the information received.

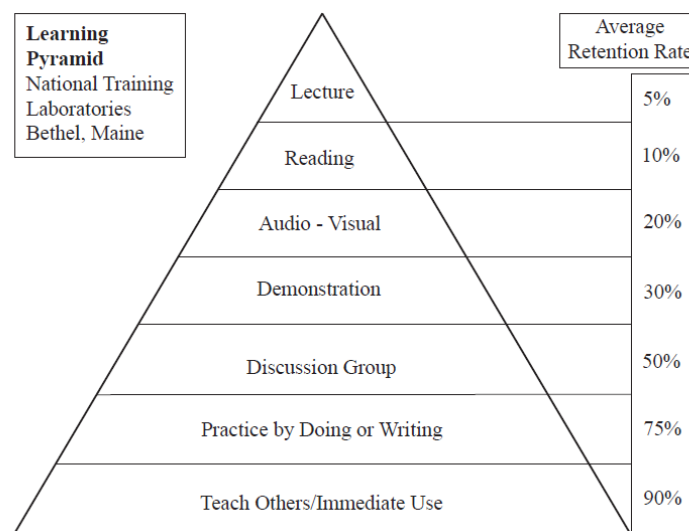Figure 2: Learning Pyramid (Wood, 2004)

Overall, it is evident that emotions stimulate desire for successful learning, which is being supported by two aspects: (1) the process involving doing and learning; and (2) receiving a feedback. Consequently, these emotions are desirable and necessary. Feedback can stimulate and make learning successful, when there is no desire to learn because it will then motivate

students to seek praise (Kurniawan, 2004). Many people prefer learning by doing instead of following a set of instructions in a manual (Rosewell, 2005). A well made GUI (graphical user interface) is a supportive environment for this kind of learning. It supports active learning and gives the user the possibility to explore, constantly leaving the user hungry for more knowledge (Lutz & Ascher, 2004). One of the benefits of interactive technologies, such as e-learning, virtual reality, and multimedia, are that they provide alternative ways to interact and represent learning material that aren't possible with books and other traditional learning material (Andresen & van den Brink, 2002; Lutz & Ascher, 2004). This allows the learner to explore and experiment with the learning material in another way.

Learning theory became known from in the 20th Century, and was divided as follows in terms of the following learning theories: (1) behavioral; (2) cognitive; and (3) constructivist.

- **Behaviorist theory of learning**

In the middle of the 20th century, education, both at schools and organizations, was based on the principle of behaviorism (Ertmer & Newby, 2013). Behaviorism is defined as the study of action as it relates to psychology and learning. This offers an explanation that can be measured and therefore, empirically validated. This concept introduced a way of learning that can be reproduced because it provides a structured method of analysis. Behaviorism favors an instructional approach, an example of which is the transmission or the transfer of knowledge from a teacher to the learner, where the teacher assumes the dominant role (Amory, 2012). Psychologist B.F. Skinner and Ivan Pavlov (1849–1936) were two of the first developed behavioralists who studied this (Ertmer & Newby, 2013). They focused on what was referred to as voluntary or operant behavioral conditioning, which is slightly different from classical conditioning (Amory, 2012).

- **Cognitive Learning Theory**

When conducting their studies, former researchers encountered obstacles, one of which is that behaviorism could not necessarily explain the majority of social behaviors. In the 1920s, restrictions on the behavioral structure of learning were addressed in detail. One of the main purposes was to help students organize and associate new information with previous knowledge, making it more personally meaningful (Ertmer & Newby, 2013). The cognitive learning theory assumes that "Learning is an active process where meaning and understanding built from experiences" (Wildman & Burton, 1981, p. 6).

- **Constructivist Learning Theory**

The constructivism theory has been developed into a new pedagogical approach by Seymour Papert (Ackermann, 2001). According to Ackermann (2001), it completely departed from the notion that learning is dependent on a teacher. Instead, it examined the process by which learners make sense of their environment and experience. In this way, knowledge is created. The factors that lead to learning: are environmental conditions and educational explanations. All these should be based on the learners' attitude, their previous or existing experiences, as well as their individual beliefs. Furthermore, for the learning process, memory is significant information that is arranged in the memory into a meaningful and well-thought way to facilitate retrieval of information. It means that the simulations and integrated systems need to be revealed step-by-step in phases or segments. This leads to two important claims when focusing on a learning approach. First, it is necessary to focus on the thinking of the learner instead of the subject/lesson that needs to be taught (Bada & Olusegun, 2015). Second, knowledge is not independent of the meaning it is associated with or the given experience (Bada & Olusegun, 2015). Therefore, the knowledge itself is separate from the student; the student must simply employ the best method of learning to retain this information. This concept determines how learners develop their knowledge individually.

2.1.2 Learning styles

Every individual is unique, which also means that learning styles will be unique. Since individual learning styles differ, these differences become evident when beginning formal education. A classroom will likely be much diversified with students who absorb knowledge and have different learning processes. When devising the most effective lesson plan, it is important to be aware of these differences so that multiple types of different students can succeed. Thus, one of the main challenges in e-learning is ensuring that people are maintained in well in the correct mind to appreciate the e-learning designed for them (Canavan, 2004). Accordingly, learning style can be described as the way a person gravitates towards learning. This can depend on individual experiences and perception of one's environment (Kolb & Fry, 1974). Knowing differences in preferences can help to motivate students to achieve long life learning when best practice strategies are implemented (Cercone, 2008). Furthermore, Markham (2000) indicates that research on learning style has to should be taken further than mere simplistic effort to help demonstrate that various persons have diverse measures and it is

those differences that contributes to definable outcome in learning. Inasmuch as there are several studies on learning styles, it is evident that the studies do not have a common thing, agreement or any criteria of approval of a particular theory (Conlan et al., 2002). Also, all researchers dot not all agree with the existing models of learning style. For example, Coffield *et al*. (2004) conducted a study on various influential learning style models, where all experimental learning styles and theories were critiqued. As a result, Graf and Kinshuk (2006b) recommended an approach that is suitable in the detection of learning styles based on the learners' behavior in an e-learning course. Also, a practical case of undertaking an online course through extending an open-source LMS Moodle, where a detector tool is used in the learning process has been proposed by Graf and Kinshuk (2006a).

2.1.3 Motivation

In this study, it was critical that the theory of motivation is appreciated in terms of its implications in learning and retention of knowledge. The study will present and show the understanding how interactive content with use of digital storytelling strategy will increase engages and participation in an e-learning course. The review of literature by Kim and Frick (2011) established that the researchers developed a theoretical framework in which the motivation of learners in an online course and the influencing factors can be understood. Kim and Frick (2011) organized various motivational factors influencing the learner in a computer-based instruction as well as e-education settings into three groups: (1) internal factors, (2) external factors and (3) personal factors.

Internal factors

Looking at the features that are related to the e-learning course, internal factors come into play. Notably, the aspects of cognitive overload as well as associated or perceived difficulty of the learning tasks involved in the course are all linked to increase of anxiety to the learner while decreasing the motivation towards learning in online settings. Similarly, Kim and Frick (2011) indicate that issues of convenience and flexibility in learning have diverse but paramount influence on the motivation of the learner towards learning on an online platform. Moreover, an aspect of learner control, which involves sequencing, access and pacing to support in learning, have various effects on the motivation of the learner to use computer mediated approach to learning. Therefore, the issue of instructional approaches that are used in the

promotion of flow and playfulness among learners are linked to contribution of sustainable motivation of the learners in learning environments involving multimedia (Kim & Frick, 2011). Other internal factors that are considered include the level of interaction and the technical difficulties and breakdown of communication that may demotivate the learners. According to Kim and Frick (2011), the issues of technical difficulties are associated with possible dropout of the learners from the e-learning program. On the other hand, the level of interaction between the learners and the learning materials are linked to the motivation of the learner in the online learning settings.

External factors

These factors are associated with the aspects comprising the overall learning environment. Kim and Frick (2011) investigated various motivation theories that underscore environmental influences the motivation of humans. In this case, it is envisaged that providing support to the learners in turn affects their satisfaction when they are introduced to or using web-based instructions. The case is different with the non-traditional adult learners. The support offered to them for various technical difficulties and other challenges they are likely to face such as family demands, is critical to encourage those learners to participate in online courses (Hudson *et al.*, 1998). Moreover, Schramm et al. (2000) argues that it is important to motivate the adult learners through provision of adequate training where they are required to use technology as a tool that improves their satisfaction with their online programs. Lastly, Kim and Frick (2011) argue that learner motivation depends on the overall climate in which the instructions and the organizational setting of the learning process are done.

Personal factors

According to Kim and Frick (2011), personal factors include the motivational influences caused that results from the individual learner, which on most cases are considered to be caused by the learners. Thus, various personal variables affect the learning and motivation such as learning style and preferences to media. Notably, Ryan and Deci (2000, p. 54) indicate that "*To be motivated means to be moved to do something*". This implies that learners do not have different levels but also diverse kinds of motivation. For example, Aduayi-Akue et al. (2017) argue that the most important aspects of personal motivation in e-learning include the level of motivation and the type of motivation (orientation of the motivation). Similarly, Ryan and Deci (2000) argue that the orientation of motivation includes the underlying attitudes as well as objectives that constitute the manner in which the learners take actions in the learning process.

Other aspects on personal motivation factors have been established such as the instrumentality, expectancy and valance (Van Eerde & Thierry, 1996).Whenever there are no such aspects in e-learning, then motivation levels will be zero. Thus, Kim and Frick (2011) recommend that effective education must be obtained when there is a motivation to learn. Also, Garavan et al. (2010) indicate that a student who demonstrates a desire to participate in learning activities is motivated to learn.

In terms of the student motivation, there are two specific aspects considered; intrinsic and extrinsic motivations. Thus, Deci and Ryan (1985) provide that the two different types of motivations can lead to action, which are pegged on the diverse goals and reasons, in the theory of self-determination (SDT). Intrinsic motivation differs with the extrinsic motivation in terms of actions involved, where intrinsic motivation means doing something based on its inherent interest or enjoyment, while extrinsic motivation leads to a separable result (Deci & Ryan, 1985). More than 30 years of research, results have demonstrated the variability in quality of experience as well as performance of a person for either internal or external reasons.

Intrinsic motivation In the STD theory, social contexts are linked to enhanced feelings of the competence particularly during an action. The social contexts therefore enhance intrinsic motivation for that particular action. On the other hand, feelings of competence enhance intrinsic motivation when autonomy is brought into action (Abeysekera & Dawson, 2015; Ryan & Deci, 2000a, 2000b). According to Ryan and Deci (2000a, 2000b), a student who makes a choice to undertake out-of-class study program or work is bound to be more intrinsically motivated compared to the one who is forced to do the same work. Inasmuch as facilitation of autonomy and competence may be considered as some of the critical factors that enhance, entice and support intrinsic motivation to learners, studies show that intrinsic motivation is highly likely to thrive in social contexts where there are also aspects of relatedness and security (Niemiec & Ryan, 2009; Van Nuland et al., 2012). Otherwise, issues of self-determined out-of-class work when followed by a study of small group work a favorable learning environment was established to improve motivation and thereby engagement between the learner and the work/teacher.

Extrinsic motivation This is a type of motivation that is realized when the learner is motivated by a specific external factor or reward. According to Ryan and Deci (2000a), some of the extrinsic factors that may motivate a learner include specifying the tasks that can be undertaken to achieve a particular objective (grade in this matter) in a given assignment. On the other hand,

SDT provides an important framework in which the relative autonomy of a behavior that is extrinsically motivated, where extrinsic motivation is considered to be inherently non-autonomous (Ryan and Deci, 2000a). A typical case is where a learner is able to complete his or her homework as they so appreciate; however, the completion of the homework influences the attainment of the overall subject's qualification, which then determine if the student is qualified for a job or not. Thus, it is the behavior of the student that is influenced by homework as the instrument to motivate learning rather than the situation where enjoyment is envisaged to be associated with the learning (Ryan and Deci, 2001a). Otherwise, a personal choice made by the student to complete the homework as a prerequisite to qualification in career influences the motivation; however, in cases where the student is influenced by the regulatory authorities to complete homework as a prerequisite to graduation, then such motivation is extrinsic. Overall, both cases represent extrinsically motivated behaviour, yet differ in their relative autonomy (Abeysekera & Dawson, 2015).

A study conducted by Duncan, Range and Hvidston (2013), shows that a success of students of e-learning is influenced by the level of rigor of the curriculum, and this provides the motivation for success. At the same time, literature reviews show that the task of the teacher is to make teaching methods different from traditional ones for engaging students in online education (Brocato, Bonanno, & Ulbig, 2015.) Furthermore, researches by Jonassen (2000) and that of Roblyer & Edwards (2000) demonstrate that inclusion of or application of technology play an important role in improving the student learning motivation. DST (digital storytelling) provides to students possible to present the content valuable and important. When the student actively participant participates in training after successful completion of complex tasks, provides confidence to the learner, and in long run, motivation (Neo & Neo, 2010; Koohang et al., 2009).

2.1.3.1 Motivation and Self-regulated learning

Motivational processes influenced by self-regulation at the initial phase of learning involve various elements but not limited to goal orientations and perceptions of difficulty and interest. According to Pintrich (2000), self-regulated learning (SRL), the significance of process of motivation depends on self-regulation. Notably, Bandura (2010) indicates that goal orientations are the model's central component, this why students are engaging in task; Self-efficacy presents belief in the human ability to learn or perform various types of actions at a particular level. The ease of learners to take and solve various problems with ease of difficulty is some of the cases where goal orientations are considered. Moreover, task value, which include the

degree of student's taste on the area of content. Feedback can motivate and even contribute towards the development of the student's self-regulation. Self-regulation means that the students internalize self-assessments, evaluation and learning strategies, which can be crucial for their success with the studies (Hattie & Timperley, 2007). This is discussed in the discussion section in the report. Some studies indicate that skills and abilities of the learners are not the specific aspects that are required to explain fully the achievement of the student (Zimmerman & Schunk, 2001). These suggest that various factors like self-regulation as well as motivation as important things in learning. To the end, it is shown that students with adaptive self-regulatory strategies are more motivated and show better learning (Schunk & Zimmerman, 2011).

2.1.4 Adult learning theory

The andragogy theory, commonly known as the adult learning theory, is a concept created by researcher Malcolm Shepard Knowles in the late 1960s. This involves attention and research devoted to teaching children—the evolution of pedagogy. Knowles argued that adults have a variety of different learning skills, unlike children, who must first develop a proper foundation before they can branch out. His thoughts on andragogy were to use strengths of adult learners in the classroom because there was a benefit to diversity. Knowles's andragogy theory includes five important points that teachers need to address in regards to adult students (Knowles & associates, 1984, p. 9):

1. The self-concept; "the learner is self directing". Adults are mature and developed, which means that they have a wide concept of knowledge and can learn on their own.
2. Past Learning Experiences; in comparison with children, adults have experience learning. Children, on the other hand, are just starting to gain experience.
3. Readiness to Learn; adults have risen to the level where they appreciate education and can take it seriously.
4. Practical Reasons required in Learning; the ability to solve problems with practical learning.
5. Internal factors driving motivation; adults are led by internal motivation, and children lean on external factors for encouragement and approval.

Many researchers argue that the self-directed approach to learning after the theory by Knowles is considered applicable only in some cases. There have been cases when Andragogy has been

criticized, because people have not been able to confirm some of the steps. For online learning, self-direction may be confusing because many learners are capable of learning on their own and do not require supervision from teachers. Other studies have focused on how more active involvement of adult students in lectures is an effective means of learning.

2.2 21st Century skills

Twenty-first (21st) Century learning skills are also known as the Four (4) C´s: collaborating, thinking critically, communicating and thinking creatively. All of these skills are important to help the student have success in school and otherwise. The 21st century is an exciting time period in which to learn because of the resources at our disposal (Rotherham and Willingham, 2010). Now that many forms of technology have been developed, people have learned how to integrate technology into their everyday lives. This means that technology can facilitate communication, research and other tasks that were previously more cumbersome. In reference to teaching and learning with digital storybooks, technology in the 21st century can become a very powerful tool. Technology can encourage students to think critically because it allows them to be independent, learn according to their strengths and have access to a giant database of information. Specifically in reference to writing, technology enables students to complete projects faster through typing, conduct the necessary research and work with other online tools that can help improve overall writing skills and composition. More recently, 21st century learning skills have been revisited to take account of transformative learning technologies and approaches and the changing requirements of emerging jobs, industries and modes of leaning, training and working. With the projected increase in needs for creatives over the impending decade, we are seeing more emphasis on skills such as sense-making, computational (and later AI) literacy, cognitive interaction, socially-motivated creativity, novel & adaptive thinking, transdisciplinary, virtual collaboration, transmedia literacy and social/emotional intelligence (Woodgate, 2018).

Critical Thinking Skills

While we are seeing a movement towards more non-linear thinking methods beyond systems thinking (Woodgate, 2018), it should be emphasized that critical thinking as well solving of problem have helped further the development of society throughout history (Rotherham & Willingham, 2010). This includes the development of important early tools and exploration across around the world. In most cases, the humans who were able to challenge existing

principles and norms were the ones able to utilize critical thinking skills in order to discover new things and become leaders in their respective interests/ crafts (Rotherham & Willingham, 2010). In order to determine the correct course of action in decision-making, an individual must be able to properly assess his situation, predict the possible outcomes and decide what will help him achieve what he wishes.

Throughout the critical thinking process for adults, certain aspects can come into play, including fear, emotions and reflections of past experiences (Helyer, 2015). Moreover, society can play a big role in decision-making due to influence from social media, friends and literature. All of these aspects dictate what society considers being the norm, which may prevent an individual from challenging something for fear of being rejected by his peers. However, within the classroom, decision-making through critical thinking is not as intense. The purpose is to develop an independent mind. Teachers will encourage this because it allows students to acquire and gain more thorough appreciation of the world around them, what they will encounter and how to handle real-life situations (Butler *et al.*, 2012).

The teaching /learning orientation are some of the important aspects that are based on the premise that a fundamental life skill requires good thinking. According to a report by Foundation for Critical Thinking (Paul & Elder, 1999), as a learner, there is need to embrace good thinking creates value whereby poor thinking only contributes to problems leading to frustrations. Students who are able to improve their thinking skills over time are able to analyze course content and utilize that throughout their educational careers.

Critical thinking is defined by the American Psychological Association (APA) as "judging in a reflective way what to do or what to believe". In today's society, there is so much information that it may be difficult not to encounter an overload (Facione, 1990, 112). This is why Yang *et al*. (2008) indicates that it is essential to inculcate critical thinking amongst the learners to enable the learners evaluate the authenticity of the claims and views that researcher have made concerning the mass of online information.

There are five measurable dimensions that have been found to reflect the importance and applications of critical thinking, where Yeh (2009) argues that critical thinking requires the ability of the learner to recognize deduction, evaluate arguments, interpret and make assumptions. On the other hand, Danish (2002) defined life skills as the skills which enable people to succeed in various environments where they live or work. These may be more commonly known as street smarts, which describe the ability for an individual to know the most appropriate way to handle a real-life situation; based on what he has been taught, his instinct as well as perception. Also, Danish and Nellen (1997) found that life skills are similar

to physical skills since they are taught through practice, where practical aspects of training include demonstrations and modeling. Moreover, life skills ensure that individual are able to succeed in various environments (Danish & Donohue, 1995). Some of the physical skills that are acquired include ball throwing, behavioral skills such as effective communication and cognitive skills such as decision-making (Danish, 2002). Since individuals encounter multiple environments on a daily basis, this enables them to succeed in multiple environments and learn things from certain areas that can be applied to other current areas and future situations.

2.3 Educational technology

Previous studies indicate an important role of e-learning in the growth of education of any country (Behera, 2013; Ekanayake & Wishart, 2015). E-learning is associated with the provision of various opportunities for developing countries, where it is credited with enhanced development of education. Moreover, e-learning plays an important function in the preparation of and generation of new generation of teachers to embrace the teaching force post the current century, with the aim of improving learning. Behera (2013) provides various benefits and provisions of e-learning to the learners, such as the provisions of individualized instructions that suit the needs, abilities as well as the learning styles/preferences of the individual learners. Considering the applicability and possibility of incorporating digital storytelling in mobile learning Ekanayake and Wishart (2015), this justifies the indicated benefit of e-learning where the police officers can repeat and test themselves several times wherever or whenever they are. This would eventually improve their performance as issues of distance or place will no longer hinder their operations or investigative work. The adoption of e-learning in educational settings has been growing rapidly since its inception in the 1990s. This has encouraged researchers to explore the implications of this new learning type. Many methods for making decisions have been developed and proposed to help in the evaluation off the relevance and effectiveness of online learning, which will be discussed in detail as the relevant literature is further examined. With technology in the classroom, environments can be more efficient and appealing. In addition, it can help overcome restrictions of space, location and time by creating equal opportunities for everyone (Eady & Lockyer, 2013). E-learning may appear in various forms of designation and uses synonymously as web-based learning, online learning, course learning, virtual classrooms learning, and digital collaboration learning. From the previous researches, e-learning has various advantages such as high motivation of the learners (users) to learn effectively the content of a program or subject. Some of the benefits include timely delivery of

the content, improved convenience in learning, and improved confidence (Zare & Sarikhani, 2016).

Leal (2009) investigated the implications of adoption of e-learning and online education in training programs for law enforcement officers in the future. The results and analysis of the study established that most users and learners find e-learning easy to use, there is high level of enjoyment, thinking and decision-making becomes interesting, and thus Leal (2009) recommends the application of e-learning for future training of the law enforcement officers. Today, many companies and educational institutions use E-learning to improve efficiency and save training time, orient teachers and researchers to implement innovative methods, technologies, tools, development and use of e-learning solutions. That is why today a scale of the use of e-learning is constantly growing and all the advanced educational systems of the world are oriented towards it. The study of performance of adult students in online courses by Chernobilsky and Hayes (2019) had a dataset mined to reveal the trends as well as patterns of success of learners. The analysis revealed that adult students have higher failure rates and lower average grades as compared to traditional students, particularly in accelerated 7-week format courses. In addition, students had lower success rates in foundational core curriculum courses, which are the basis of learning key content and competencies (Chernobilsky & Hayes, 2019). Therefore, the results of the study by Chernobilsky and Hayes (2019) suggest that student success issues can be identified with analyzing even small datasets.

Recently, the e-learning market worldwide grew by 35.6% (Wu *et al*., 2006; Arbaugh & Duray, 2002), but errors exist. In fact, there is no known reason why several users stop e-learning after their first experience. Surveys that were conducted in different working conditions revealed a number of factors which may influence satisfaction of the users in e-learning.

Al-Qahtani and Higgins (2013) provide quality of well-designed online learning programs is one of the significant and critical factors that influence learning effects as well as the satisfaction in the learning (Fig 3).
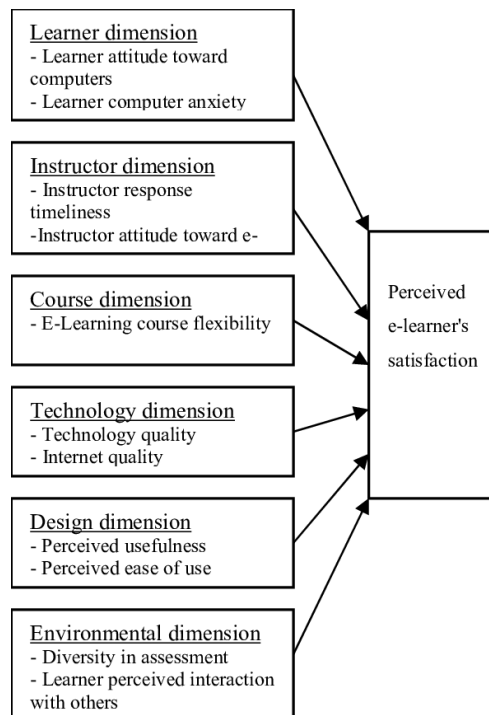
Figure 3: Aspects of perceived e-Learner satisfaction (Sun *et al*., 2008)

2.3.1 Effectiveness of e-learning

Online learning (e-learning) is one of the effective methods of learning that can significantly improve the performance of novice learners. For example, situated e-learning can also improve the cognitive ability of the learners compared to traditional learning (Feng et al., 2013). Moreover, it is also useful adjunct to traditional methods of learning for students; however, it does not appear to contribute any benefits to the other learners have different specialties.

2.3.2 Technology

Paradigm of e-learning success increased in recent past, so it led to the demand for e-learning systems in educational institutions and universities, which led to the development of open source learning systems (LMS) (Lyashenko & Frolova, 2014). The use of LMS provides the possibility of easily publishing different types of documents, lectures for professors at the educational organizations. An LMS is a platform that is easy to use for both the participants and the developer. There are several claims that believe that LMS will provide efficiency when it comes to teaching. Delivery of large resource-based learning programs to the high school contributes to flexible course delivery, the opportunity to use different resources, different

types of collaborative projects, communication and conferences (Ryan et al., 2000; Coates et al., 2005).

2.3.3 Authoring tools

Authorization systems define a program that spends the opportunity for the user to manipulate multimedia objects. In the same time, it allows and non-programs to easily manipulate and create learning software with unique programming features. Much of the programming embedded and hidden inside authoring systems, what provides ease of use for the user, because the user don't have to know how to effectively program it. Authoring system consists of three main components, which include control of content delivery, content organization, and type of assessment. The organization of the content allows the user to organize and structure the content. Content delivery control refers to the content submission process, and how much student adapts to this content. The assessment gives the opportunity to the students to test outcomes of the learning within a system; it can be submitted in test form for example. Today platforms for business training and academic LMS employ some of the specific file formats as well as the standards that are not available in a more generic creation tools for learning content (Martinez, 2017).

2.4 Digital storytelling

Over the years, the concept of digital storytelling has evolved into a concept where people are able to utilize technology in order to tell their stories. In the context of education, this can mean a way for teachers to convey learning material to their students through the implementation of technology in accordance with traditional teaching methods. This is appealing to many students in today's society as a result of prevalence of technology in our everyday lives. For these students, it is difficult to imagine a day without some form of technology; therefore, the simple implementation of digital storytelling may be eye-catching and a way to make students more attentive. When they are attentive and like the teaching method, they are more motivated and more likely to perform at high levels.

Digital storytelling is a form of technology which enables users to combine technology with the ability to convey material or stories to an audience. This involves researchers to use computers in a creative manner to conduct comprehensive research, to write a script and thereby develop plot and characters. Learners who are participating in the full digital storytelling can also benefit from various aspects of learning such as critique of their own work

while facilitating their emotional intelligence (Robin, 2008). Thus, as a tool in learning, it also calls upon the learners to be creative and helps those students to learn through action (or doing) (Gimeno-Sanz, 2015). However, digital storytelling differs from conventional storytelling in various fundamental aspects. For example, Dörner *et al*. (2002) indicate that digital storytelling require the users to be viewed as people who can interact and thereby shape the story other than being mere listeners.

Center for Digital Storytelling's Seven Elements of Digital Storytelling	
1. Point of view	What is the main point of the story and what is the perspective of the author?
2. A dramatic question	A key question that keeps the viewer's attention and will be answered by the end of the story.
3. Emotional content	Serious issues that come alive in a personal and powerful way and connects the story to the audience.
4. The gift of your voice	A way to personalize the story to help the audience understand the context.
5. The power of the soundtrack	Music or other sounds that support and embellish the storyline.
6. Economy	Using just enough content to tell the story without overloading the viewer.
7. Pacing	The rhythm of the story and how slowly or quickly it progresses.

Figure 4: Seven Elements of digital storytelling (Robin, 2008)

The power of students in the acquisition of skills in the 21st century that use the latest technological advances in effective communicate is facilitated by students who actively participate in the creation of digital storytelling. Learners who take part in the full digital storytelling experience are bound to benefit from learning the act of critiquing their own work including that of their peers, which in turn facilitate social learning (Robin, 2008). Notably, Burmark (2004) established that integration of interactive content like the visual images that has well-written texts enhances and even accelerate the learner's comprehension. Similarly, digital storytelling is an especially good technology tool for the collection, creation and analysis of the visual images alongside that of the written content. For the last few years, the practice of digital storytelling has therefore become a very powerful teaching and learning platform and tool, which engages the learners with the teachers. However, there has been little effort put towards incorporation of a theoretical framework on the effectiveness of technology towards increase such tools in the classroom. The attraction of digital stories filled with multimedia increases the interest of the student to the study of new ideas (Robin, 2008). Thus, Jakes and Brennan (2005) argue that when using the DST a powerful learning experience,

which covers much of what the society offers to the learners, where the learners will be able to learn and undertake what is expected of them in 21st Century. According to (Yang & Wu, 2012), "digital narrative promises to give students a variety of skills, including critical thinking, information and technological literacy in the learning environment"

Digital storytelling that inform or instruct

Digital storytelling is a promising tool that equips learners with various skills that involve critical thinking, information processing, and technology literacy in an environment that is meant for learning- or instruction (Kotluk & Kocakaya, 2017; Yang & Wu, 2012). According to Nguyen (2011), digital storytelling influences the control of the process of learning, which also focused on the learning as well as responsibility taking, motivation to learn and the art of self-expression. Nevertheless, digital storytelling contributes towards the development and production of an authentic story concerning a particular context or theme, where various multimedia sources are used (Nguyen, 2011; Kotluk & Kocakaya, 2017). In most, if not all of the digital stories, they are formed through synthesis of elements like graphics, text or voiceover among others, which are relevant to the subject under consideration (Kotluk & Kocakaya, 2017; Robin 2006).

Since digital storytelling enables both trainers (teachers) and learners to become active learners in a particular subject and thereby acquire technological opportunities that the 21st century offers, there are views on how and why e-learning and digital storytelling are important methods in learning (Quigley, 2018). Also, a fundamental purpose of digital storytelling includes fostering of active learning in teaching-learning environment that comprises principle requiring people to take responsibility of their personal learning experience amidst the rich-learning process (Bromberg *et al*., 2013).

2.5 Online course design

2.5.1 Instructional design

Instructional design, or commonly referred to as instructional systems design helps people come up with directional and organized manners in which to present information. This can be utilized to provide relevant instruction, to present products or for other research purposes. Originally designed for an in-person application, instructional design is now very popular in the online world, as people have recognized the power of being able to systematically develop

and teach certain subjects in this way (Branch, 2009). It is relevant to education, because professors will be able to use instructional design to develop relevant lesson plans, aimed at providing students with the best information possible. For creating a solid e-learning for police officers' student when investigative decision making, it's important to follow the TAM model instructions and principals.

Davis (1989) developed a technology acceptance model (TAM), which was founded upon the theory of Ajzen and Fishbein (1976); whereby, the TAM postulates that the "perceived ease of use (PEOU) and perceived usefulness (PU) of technology are predictors of user attitude towards using the technology, subsequent behavioral intentions and actual usage". The most critical aspect in the theory was perceived ease of use, where Davis (1989) indicated that it influences the perceived usefulness of a particular technology.
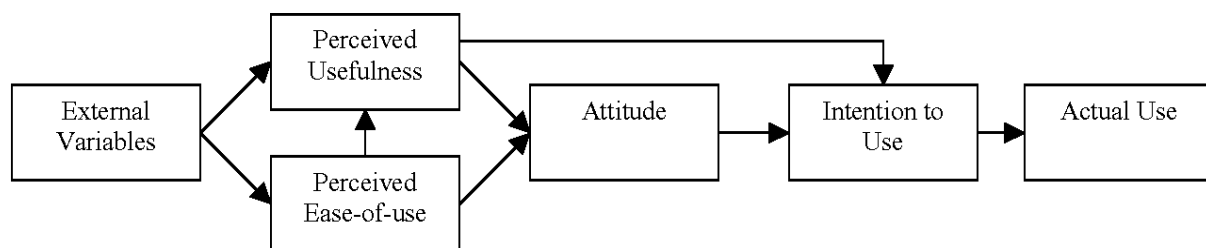

Figure 5: The original technology acceptance model (Davis, 1989)

Accordingly, the perceived usefulness as prescribed in the TAM involves the degree to which a specific user perceives and believes that application of a technology at work contributes to improvement of the work. On the other hand, perceived ease involves what the user considers the effort(less) in which the technology is applied. Notably, both perceived usefulness and perceived ease are distinct factors that play a role in the user's attitude towards the use of a technology (Masrom, 2007). However, the perceived ease of technological use influences the perceived attitude and usefulness towards a given technological use. According to Kim and Frick (2011), the instructional design principles that are important for the sustenance of the student motivation is the self-directed online learning include: (1) the provision of learners with the content, which is useful and relevant to the learners; (2) incorporation of the presentations using multimedia which is able to stimulate interest of the learners; (3) inclusion of the learner activities that are able to stimulate the real-world situations; and (4) providing the students with feedback on their individual performances and hands-on activities that can engaged the students in learning. Davis (1989) points out the strong connection between PU and PEOU and

use. That is, even if a product that is difficult to use may have a demotivating effect on the user of an otherwise useful resource, no degree of usability can compensate for a resource that does not perform any important or useful function (Davis, 1989).

2.5.2 Cognitive load

This theory was developed by Sweller (1988). According to Sweller (1988), "Cognitive load" relates to the level and amount of information that a given working memory is capale of holding at any given period. Thus, Sweller (1988) argues that, since working memory has a limited capacity, instructional methods should avoid overloading it with additional activities that don't directly contribute to learning. There are many different influencing factors affecting the learning process. One of them includes the Cognitive load theory (CLT). This CLT refers to learning and instruction theories which best describe any implications of an instructional design involving a human cognitive architecture. However, such arguments are based on the long-term memory, which is also permanent knowledge. Processing and short-term storage requirements for working memory can provide to cause cognitive load. If this load exceeds the limit on working memory, the capacity to process information may be reduced, also having a negative effect on memory creation (Kalyuga, 2011).

In another work by Swellers (1994), the theory of cognitive load (CLT) is divided into three types. First, the intrinsic cognitive load (ICL), which postulates that load resulting from the internal complexity of a material used in learning can be measured using the degree of the interconnections between the information that should be considered to belong to the working memory at the same period (Sweller,1994). Further, there are extraneous cognitive load (ECL) and the germane cognitive load (GCL) (Kalyuga, 2011; Swellers, 1994). According to Swellers (1994), internal cognitive stress cannot be changed through instructional interventions, since it is related to the complexity of the material being studied. The resistance to this external cognitive load is presented as unnecessary cognitive load can be changed and determined by the instruction design. The same goes for Germanic cognitive stress. Instructional designers can manipulate the external and Germanic load, it is also suggested to attempt to limit external load and promote Germanic load (Sweller, from Merrienboer & Paas, 1998). Overall, CLT is important in learning, where it is associated with efficiency of the learning process, where training methods that are able to reflect on the learner's appreciation include reduction of the problem space and merging of multiple materials and source of visual aids (information) to supplement other methods of training.

2.6 Summary

This chapter is aimed at providing an essential foundation regarding the knowledge of digital storytelling. First, it was necessary to review how technology has been previously implemented and implications studied with respect to the daily lives of students and whether or not it was successful. This chapter demonstrated that many researchers discovered that online learning tools can be very powerful and thereby aids students in their development, critical-thinking skills and decision-making (cognitive) skills. Moreover, it was important to recognize the wide variety of learning styles in the adult world. Although this can seem like a daunting task for teachers to devise a lesson plan that can work for the learning methods of a large class, it is possible to attract the attention of students and motivate everyone through the implementation of technology. Therefore, it is evident that technology, when working in accordance with traditional forms of teaching, can be very successful and boost the learning of students involved. With this successful method, classrooms are able to enhance learning and devise methods of engaging students. The next chapter therefore covers the instructional design of this research paper in which the researcher utilized knowledge from the relevant literature to determine the effectiveness of technology and digital storytelling in a real-life classroom.

3 Instructional Design

For the development of education and other training courses/programs, instructional designs are used as the systems of procedures that aid such process, providing a reliable fashion (Gustafson & Branch, 2002). In education pedagogy, instruction design is perceived and thus considered to be a process that works best when corresponding contexts are matched. For example, complex issues that are associated with learning provide educational contexts that can be best sorted by through adoption of appropriate instructional design. According to Gustafson and Branch (2002), the instructional design must be developed in a sensitive manner to help differentiate educational contexts. In this regards, instructional design are evidently iterative process of planning outcome, which includes key criteria such as: making choices on the effective strategies that can be used for learning or teaching (Gustafson & Branch, 2002). The instructional designers believes that systematic design procedures when used in the process can help make instructions given to the learners more effective, reliable and even efficient, compared to the less rigorous approaches to educational planning instruction. The system approach indicates that an analysis of how various components interact in the instructional design with each other and the need for coordination of all activities (Gustafson & Branch, 2002). According to Huang and Johnson (2011) through instructional design, the distribution of cognitive load is optimized. Based on a constructivist perspective, there are eight constructivist principles proposed by Savery and Duffy (1994) to guide the instructional design of multimedia learning environments. They include: (1) all learning activities should be anchored to a larger task; (2) developing ownership should be encouraged to support learning for the overall task; (3) only authentic tasks should be designed; (4) tasks and learning environment should be designed in a way that reflect the complexity of the environment where the learners are capable of functioning at the end of learning period; (5) the learning ownership should be designed as the process of developing a solution to the task/problem; (6) designing of the learning environment in a manner that supports and even challenges the students' thinking; (7) to encourage and ensure testing of ideas against alternative views held by the learners as well as their relationships; and (8) to create space and support for possible reflections of both the content given to the learners and the process itself. The eight principles can help guide the way the practice of designing teaching and training environments (Wilson 1995).

3.1 Instructional model ADDIE

Several instructional design models have been developed, but regardless of which model being used, most are based on the Analysis, Design, Development, Implementation and Evaluation (ADDIE) model, which is a distinct part of the practice of instructional design. The ADDIE consists of the five phases that are based on different activities in the production of learning material. The model is considered as one of the most common models and embraced for it is simplicity among compared to other instructional design models (Alajmi, 2009). Moreover, ADDIE is recognized for its ease in the application and creation of possibilities towards the cyclical features of the process (Alajmi, 2009). Therefore, ADDIE has remained to be the most effective tool in creating educational products. The reasons behind the benefits of using the model include serving as the guiding framework for complex problems and learning situations, where the model helps in the development of learning and other educational resources. Other benefits include (Branch, 2009):

1. Analysis of problems through identification of various causes for a gap in performance;
2. Designing, where it helps in the verification of the desired performances as well as testing for appropriate methods;
3. Developing, were ADDIE generates and also validates some of the learning resources;
4. Implementation; where it prepares the learning environment as well as engaging the students;
5. Evaluation; it is useful in the assessment of the quality of the instructional products prior and after implementation phase.
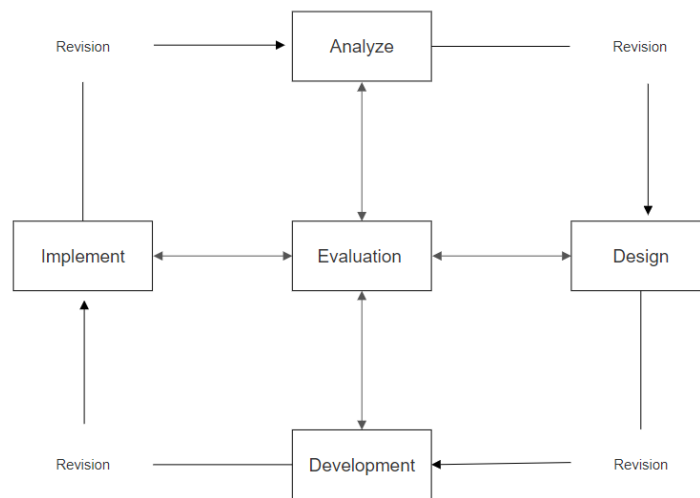
Figure 6: ADDIE model. Based on model from the book Instructional Design: ADDIE Approach, (Branch, 2009)

Development process

Based on the earlier theory and literature mentioned in previous chapters, an e-learning solution is developed that can support the user's expectations in the learning process. The possibility to correct any errors and defects is given before the e-learning solution is to be used by the participants.

Analyzing.

To get the best results from developing a successful e-learning solution, a meeting was held between the developer and lecturer Dr. Ivar Fahsing. Important acceptances that could affect the development of e-learning solution were addressed and discussed. Main goals: The target audience, the participant's level of education, example of the task that is included in e-learning, their needs, time limit for completing the e-learning, the lecturer perspective on training with educational technologies.

Designing.

The design stage is the actual planning stage in which the choice of development tools and methods for developing an e-learning course.

After meeting with the lecturer of the police high school, the development of how the e-learning solution should be designed started. Important elements were adopted that can promote learning with existing and possible technologies that support the learning process in the best possible way when it comes to investigative decision making. Special attention was directed to

main goals when it comes to designing successful e learning solution, which authoring tools for e-learning should be used, how to present it, what kind of tasks the module should contain, how much theory, media, video or images to include, how long the module itself must be, which technique should be used with thought in order to get the best learning outcomes.

Developing

After the analysis basis and the specifications in the previous steps were stated, the development phase implementation process was started. More information will be presented in chapter 3.2

Implementation and evaluation.

The last two steps in the ADDIE model, the implementation phase and the evaluation phase, are reviewed as part of the research design. The ADDIE model represents these phases.

In the implementation phase, necessary modifications of the resource-predictive efficiency and positional results are re-evaluated, and the evaluation phase deals with evaluation of the design and is explained in the discussion chapter in the task.

3.2 Development of course

Course design

As mentioned earlier in the theoretical chapter 2, there are many different strategies which can be used in the development of an e-learning course. Based on the theory of the ADDIE model, this chapter outlines the procedure for developing the module.

The course was created with a responsive Adobe Captivate project using the Fluid Box layout. It provides an arrangement of the useful objects on a slide, whereby the objects are capable of predicting when the slide accommodates various screen sizes and devices. The course was exported to HTML5 and after woods uploaded on web server. Then link to the e-Learning course was available on police high school website.[6]

---

[6] https://forskning.no/

3.2.1 Storytelling implementation technique

Digital storytelling strategy was used in e-learning to increase student's learning motivation and engagement, when using interactive content, including those elements: graphics, interactivity and video.

Figure 7: Illustrate instruction of the course

Interactivity

Interactivity used to make it easily navigate and to increase students' interest when using e-learning. Including a menu containing tabs and a button for each of the main topics of the module. This is available to the user through the module and allows him or her to navigate as they wish (see Fig 8). In addition, each slide in the module includes the next / previous button, with the opportunity to navigate easily.

Figure 8: Hypothesis writing

Video

Videos used in the module are informative and are intended to give users a clear understanding of a problem statement when doing the case-task. The introduction video represents the main part of the whole case, and also shows the users why they should make attention to the task. To minimize the effort needed to display a video and increase the amount of information stored by display, they are kept short. Participants use the headset to not interfere with each other when the video is run and watched at the same time. They must watch the whole video before they can continue the eLearning course.
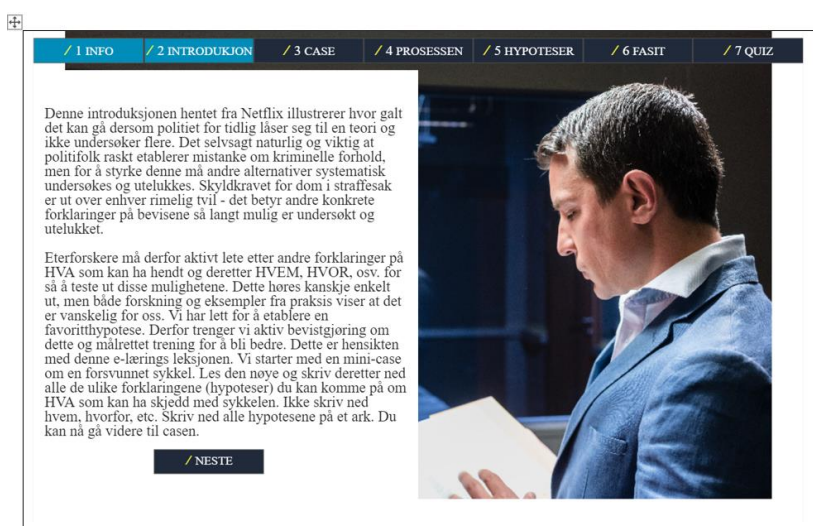

Figure 9: Illustrate explaining of the problem statement

Images

Various images were used in e-learning to make more interactive and visual and easy to understand better the text content for the students. It acts as a supplement to the text, which helps the users to visualize information used. Some images were created with Adobe Photoshop program. An example of this is visualization of the mini case in the module, and investigation circle among others.
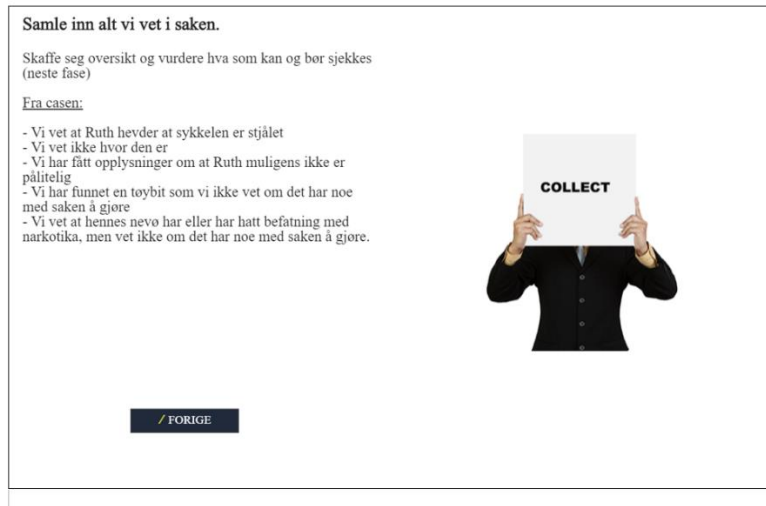
Figure 10: Illustrate investigative process

Text

Text present the theory part which is very important. The main point was to make it not boring when students reading so choosing of right font was the main criteria.

Text is kept to a minimum as an attempt to reduce amount of reading required by the user. Long sentences and phrases are translated into shorter, more informative, topics, sentences, and/or bullet points. Text is never used as the only source of information and is always supplemented with pictures.
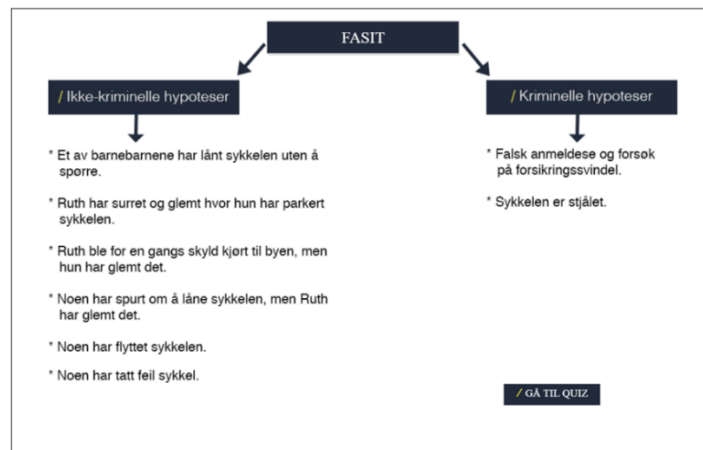
Figure 11: Blueprint for mini-case task

Quiz

The constructed questions were based on theoretical background. The Quiz (see Fig 12). provide the user's understanding of the topic and theoretical aspects they have completed through the eLearning course. User will have opportunity to repeat the theory part and how well they understood the theory part from the book, presented in the e-learning course. If the user completes the quiz successfully, it may have an impact for participants result when working with the main case task. The questions came in the form of multiple choices. The limitation was so the users had one opportunity to perform the test.

Figure 12: Quiz

Table course structure

This is illustrated in the course structure. Where the participants first go to the website[7], then course introduction, video illustration from Netflix, read and implement the mini case (Attachment) by writing various possible hypotheses, go through the investigation theory circle, see the task's blueprint and take theory quiz. At the end of the quiz, participants can see how many points they have scored, also they have the opportunity to check all the correct / wrong results from the quiz.
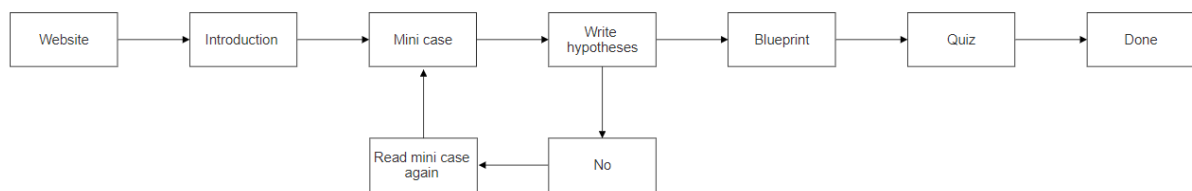

Figure 13: Course structure

---

4 Research Design

In this study, case study was adopted as the suitable research design. Previous studies have adopted a similar design for educational research, providing a justification for its choice and use in the present study. Rowley (2002) indicates that a case study is an empirical research which examines a modern phenomenon in a real life context, providing a distinct boundary between the context and the phenomenon under consideration. In this study, case study as a research design can help the researcher understand the complexity of a program or procedure, as well as implementation and its impact on the participant (Salkind, 2010). Similarly, Maxwell (2010) argues that the real quantitative or qualitative distinction between phenomena do not exist between number and text. However, such differences exist between the appreciation of the world through theory of variance, with various variables and correlations featuring to enable clear understanding of the world by a theory of interactions in the world (Salkind, 2010).

According to Yin (2002), the advantages with case studies are: The evaluation of the data is often done within the intended setting; variations in process support collecting both and qualitative data; results that may not have been found with experimental research or surveys. The disadvantages with case studies are according to Yin (2002): "too often the Case Study Facilitator are careless, and allow unclear evidence or biased views to alter the results and conclusions; Since some facilitators like to use a small number of participants it however provides very little basis for scientific generalization; Case studies are often thought of as being too comprehensive, hard to manage and produces a lot of documentation".

For this research, the chosen case study research method with the Instructional Design (ID) process was reached design and develops an e-learning. A case study research method with the ID process would support the design and development of a successful e-learning course. This study will investigate whether police high school students can experience the impact on learning outcomes and were motivated and engaged by interacting with an e-learning.

The triangulation method in this study (which involves the use of more than one method in data collection of the same phenomenon (Hopf *et al.*, 2016)) was used to uncover the problem under consideration. Thus, in the present study, triangulation method was adopted through a combination of qualitative and quantitative methods of data collection to form a comprehensive picture of the case. Triangulation involves the practice of have a view of things from more than one perspective. That can mean that different methods (including different sources of data) can be used within the study. The main objective of the triangulation method is to allow the

researcher to get better understanding of the things under investigation from different perspectives (Denscombe, 2008).

4.1 Quantitative and qualitative research methods

Quantitative study design is specific and well structured (Kumar, 2019). In quantitative research, the term reliability means that results are generalizable, and another researcher can achieve same results by transferring the experiment to a similar target group. "Reliability is used for consistency or stability of the measurements" (Mohajan, H2017). Qualitative study design only has a few or none of the attributes mentioned about quantitative research. Qualitative research is less specific and precise, but aims to appreciate, provide an explanation, and thereby clarify situations and attitudes among others from a group of people (Kumar, 2019; Møller-Stray & Haugland, 2017).

4.2 Participants

40 students signed up to participate in the survey. A link to Survey Monkey was created and sent to Stevern Police School. Anyone who wanted to attend this study could register voluntarily, at the same time the students have registered the mail address and telephone number, with the understanding that we could contact them directly. There was a specification requirement that enrollment should take place between the students who take the first year bachelor's degree. When the actual research took place, everyone received information orally about the project. The participants were handed out and signed a consent form for participation in the research project. They received information that states that it was voluntary and participates in this study and there is the possibility to withdraw. After completing the survey all the participants were anonymized. In the Survey Monkey questionnaire participants where anonymized by being assigned a user number that followed them through survey monkey program.

4.3 Data gathering

Much of the research on eLearning focused on the effectiveness when compared with traditional classroom learning. The consideration of effectiveness is usually assessed through post-course questionnaires that are thereby completed by students, including other methods such as direct observations of online activities as well as making of comparisons between test/course grades and other aspects that measures performance. To be able to collect useful data, two data type was chosen: Different procedures can be used when it comes to data collection. With this research purpose, relevant data collection method was used.

Figure 14. illustrates how the methods used for data collection involve the participant's actions in completing the course.
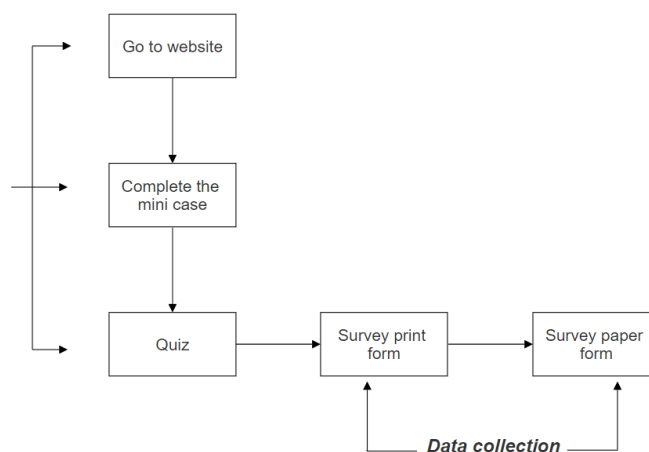
Figure 14: Data collection process

4.3.1 Collecting data from quiz

The participants submitted the quiz, after they have been through the e-learning course; it covered the questions that entail basic theoretical understanding of the task. Quiz involves the questions that have complicated multiple answers with several options. Due to some challenges that arose in this process, it was not possible to collect that data. Most learning platforms support the SCORM standard. The police school using Canvas (LMS) was not available; consequently, the collected data was out of date in this case.

4.3.2 Collecting data paper form questionnaire

The inclusion of the quantitative and qualitative findings has the potential to enable the researcher appreciate insights that could not otherwise be gleaned using other research methods. However, the fusion of the qualitative and quantitative of findings was not projected

at the initial stages of this research. Nevertheless, it was still important to if the findings could suggest interesting contrasts and thereby help to clarify each other. Data collected from quiz can be provided in paper format or from online surveys. In the project, both parts were used. Misunderstood questions of the participants, all the answers were removed and the data was cleaned before analysis.

In the survey, both qualitative and quantitative data was collected. Open questions are usually analyzed as qualitative data and closed questions such as quantitative data. A tool to analyze questionnaire data is Google Forms 8. The questions can be created from Google Forms, then share the link with the participants, or the facilitator can manually add the typed answers to the online questionnaire. In this case, mostly use the five-point scale, which measures by Agree (1) one end and disagree on the other one (5). Neither agrees nor disagrees in the middle (3). After the participants went through the course and completed the quiz section, a paper-based survey (Attachment) was presented. The survey contained both open and closed questions, which are distributed in the form of a similar scale and the questions with more detailed answers are required from the participants' side. Therefore, this survey collects both qualitative and quantitative data. The purpose of the survey is to form a picture of the demographic distribution among the participants and to map their attitude and experience using the e-learning for police officers training.

4.3.3 Collecting data print form questionnaire

After the participants had read chapter 1 in the theory book, they were presented a made-up scenario, which represented the potential of real-life criminal cases for a start-up phase. Participants would then review the advice given below. They found each step on its own page according to the case-task, where they wrote down their possible hypotheses regarding the case-task.

They got approx. 45 minutes to complete the case-task, where they prepared to meet a lot of pressure on time; therefore, it was suggested in the oral information that they write down all options as soon as they can think of them, and try to keep the suggestions as short as possible. They were not allowed to discuss with others or use reference material on / off the line during the exercise. After they complete the case-task, participants would follow the link to Survey Monkey. There they received the participant numbers, which were handed out together with case-task to each participant. At Survey Monkey they had the opportunity to tick off and choose all the possible hypotheses that they had come up with earlier in the task process.

4.4 Procedure

The Procedure subsection is about what was done. This is in the logical time order that activities actually happened. The survey took place at the Stavern Police College, March 12, 2019. All participants who volunteered were gathered in a room for general information regarding this study. After oral presentation of the study, the participants were divided into two different groups; Experiment group and Control group. Two classrooms were available for the both groups. The Experiment group, that was testing the e-learning, had 45 minutes to complete the task. After a brief presentation and instruction that was presented orally to the participants, they were asked to sign consent for participation in the research project. At the same time, they were delivered case-tasks in paper form, the pages from the textbook in paper form, the link to the e-learning lesson and to the Survey monkey. After reading the pages from the textbook that was handed out, they went through the e-learning and completed the quiz. Each participant should read the case-task scenario. They should first write all their answers on paper, then each participant would enter their answers (hypotheses) digitally. When each participant finishes the main-case to the end of the case-task, they have to choose possible and current hypotheses.

The control group that was testing the traditional solution had 45 minutes to complete the task. After a brief presentation and instruction that was presented orally to the participants, they were asked to sign consent for participation in the research project. At the same time, they were delivered case-task in paper form, the pages from the textbook in paper form, the link to Survey monkey. After reading the pages of the textbook that was handed out, they read the main case-scenario. When participant finished main-case to the end of the case-task, they had to choose possible and current hypotheses. At the end of the survey, the respondents were asked how they felt and if they had any questions. Finally, all participants were debriefed on the nature of the research and thanked for their participation. 'When everybody was finish with the survey, me and the lecturer Dr. Ivar Fahsing gathered all the participants and presented the results of the survey that was collected at Survey Monkey.

4.5 Analyses

Analysis is about understanding, explaining and interpreting, "lifting" the empirical material. In this study, implicit and explicit words and actions are translated into phenomena and events becoming more understandable. It is easier to analyze and interpret quantitative data that are characterized in the form of numbers than qualitative data that cannot speak for them in the

same way. There are various ways to analyze the qualitative data material. Qualitative analysis is described as systematic information processing.

According to Bengtsson (2016) analytical work begins with decontextualisation of the data material, which means that it is detached from its original context, in this case transferred from it physically out of the "field" and "into the classroom". Getting a complete understanding of data, a recontextualization of the data material is important. The researcher questions his or hers own material, structures and cleans the material in a systematic manner using theory and analytical concepts. Recontextualisation involves different degrees of "interpretation" is a type of translation from something less known to something more familiar. Part of Recontextualisation is to see the data in theoretical and empirical contexts, to link the material to theoretical categories (Conneeley, 2002).

In this study, data were collected from the paper form and print form survey. The paper form survey was structured and manually processed the information collected. The participants' additional information was collected in a separate document (In the annex). The print form survey collected all information on Survey Monkey. After both data was collected, it was manually plotted and transferred to Google Spreadsheet. Finally, all empirical data from previously mentioned activities were collected and organized for further discussion and analysis.

4.6 Reliability, validity and limitation

Reliability and validity issues are very important aspects to consider in both qualitative and quantitative researches. This simply implies that there is need to evaluate and ensure the quality of the research in terms of the findings that would be later used in practice and in the development of various theoretical frameworks for future studies (Noble & Smith, 2015). Issues of reliability and validity and deeply rooted in the positivist school of thought, whereby, in a research, they should be defined in a naturalistic manner (Golafshani, 2003). Thus, reliability is considered in terms of the consistency and quality of a given measure under study such as the internal consistency, inter-rater reliability as well as over time consistency. Just like reliability, validity is employed in the quantitative studies to provide a springboard to investigate and examine what they entail in the developed research paradigm. Thus, they are important in the illumination of the various ways through which the quality of the data can be tested and validated. Since this study focused on the general education program, generalizability of the results was envisaged to be significantly limited in the preset research.

Thus, the results focused on ensuring validity and reliability through focusing on only police students in Norway, in terms of the influence of digital storytelling in their investigative practice involving missing children. This in turn ensured that data was collected from considerably credible resources (police students), implying that issues of consistency and validity are guaranteed in this study. However, a potential limitation to the data collection and consequently outcome of the analyzed data was misinformation provided by the study participants. Otherwise, all the research participants were encouraged to give correct information as per their knowledge on what they know about each question in the survey. Moreover, in terms of the reliability and validity for the qualitative research, aspects such as trustworthiness and believability of the findings were considered.

5 Result

This chapter presents the measurement of quantitative and qualitative data collection from both the print form and paper form survey. All the results performed and presented in the order the survey was conducted.

5.1 Collected data

5.1.1 Survey in print form

This showed the benefits and implications of e-learning as a means to helping Norwegian police students generate hypotheses. Where Control group (blue color) represents - traditional learning group; and where Experiment group (orange color) represents the E-learning group. A number of statistical tests were conducted to compare the number of generated investigative hypotheses in the case delivered by control group students compared to experimental groups of students. In experiment group eleven (55%) students have chosen Murder hypothesis, all (100%) students registered that it was Kidnap, eighteen (90%) think it was Runaway, Accident hypothesis chose three (15%) of the students, Sudden Illness 2 (10%) and only one (5%) student chose the Suicide hypothesis. In the control group, a bit different results, 13 (65%) students have chosen Murder hypothesis, 19 (95%) students registered that it was Kidnap, 15 (75%) think it was Runaway, Accident hypothesis selected seven (35%) of the students, Sudden Illness four (20%) and only three (15%) of all students chose the Suicide hypothesis (see Table1 for an overview).

Hypotheses	Experiment group (n=20)		Control group (n=20)	
	Percent	Freqency	Percent	Freqency
Murder	55 %	11	65 %	13
Kidnap	100 %	20	95 %	19
Runaway	90 %	18	75 %	15
Accident	15 %	3	35 %	7
Sudden Illness	10 %	2	20 %	4
Suicide	5 %	1	15 %	3
Average	45,8333		50,8333	

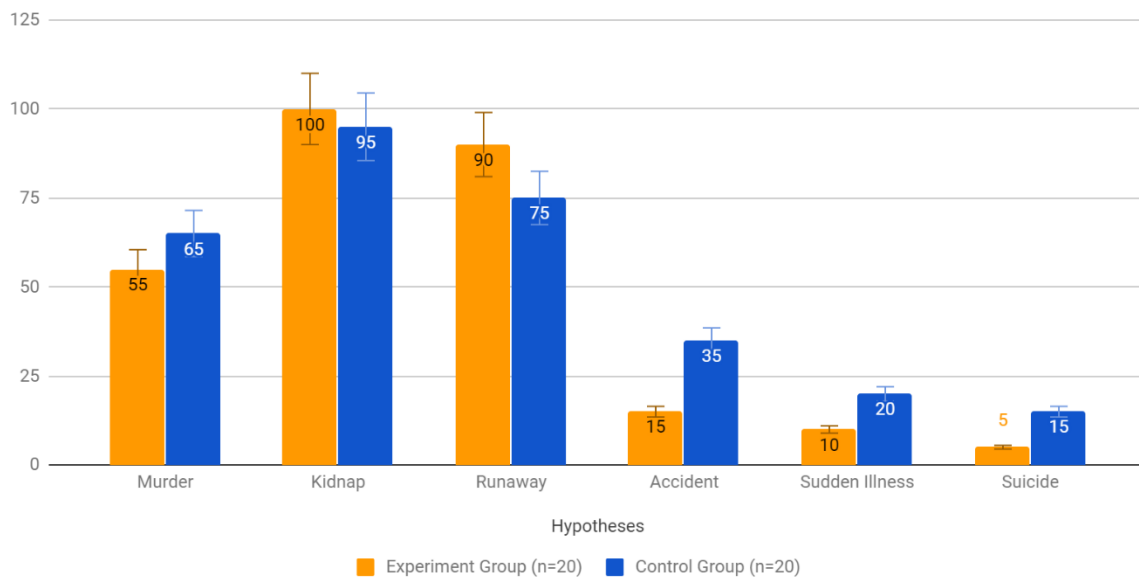Table 1: The number of generated investigative hypotheses

Figure 15: The effect of e-learning on police students hypotheses generation

5.1.2 Survey in paper form

The survey was divided between two groups and contained different types of questionnaires. Both surveys were divided into four categories: background information and demographics, learning experience and user experience. Attachments follow all questions and results.

Background information and demographic distribution

In the Experiment group: The target group between 20-23 consists of 15 (75%) respondents, the age limit from 24-26 consists of four (20%) respondents and only one (5%) of all respondents was between 27-40. In terms of the data draft, none (0%) in the age group under 20. There were 55% female and 45% male respondents. About other higher education, no one (0%) who had a master degree previously, one (5%) person who had a bachelor's degree and 19 (95%) had neither of these two degrees. Concerning the questions about previous experience with e-learning: 25% had little experience, 65% had average experience and only 10% registered that they had considerable experience. 90% of respondents responded that they were using e-learning during their studies, and only 10% answered no.

In Control group: The target group between 20-23 consists of 14 (70%) respondents, three (15%) in the age group 24-26, and three who make up (15%) in the age group 27-40. There were no (0%) registers under the age of 20. Female constitutes 45% and male 55% of all respondents in the control group. Three (15%) of them had bachelor degree from before, no (0%) master degree and 17 people who make up (85%) have records that they have none of these two (see Table 2 for an overview).

Experiment group			Control group		
Age			Age		
Under 20	0	0 %	Under 20	0	0 %
20-23	15	75 %	20-23	14	70 %
24-26	4	20 %	24-26	3	15 %
27-40	1	5 %	27-40	3	15 %
Gender			Gender		
Female		55 %	Female		45 %
Male		45 %	Male		55 %
Other higher education?					
Master degree	0	0 %		0	0 %
Bachelor degree	1	5 %		3	15 %
Non og those	19	95 %		17	85 %
Previous experience with e-learning					
Little experience		25 %			
Average experience		65 %			
Considerable experience		10 %			
Have you been using e-learnig during you studies					
Yes		90 %			
No		10 %			

Table 2: Background information

Learning experience

Experiment group:

20 responses: when participants where asking; have you dealt with similar case studies before 18 (90%) answered no, only two (10%) answered yes.

20 responses: 12 (60%) find this e-learning solution more effective when undertaking the case scenario, five (25%) maybe and only three (15%) participants responded no.

19 responses: On question: Do you think you got better outcomes by using this e-learning solution compared to your usual method of studying, 12 (63%) answered yes, five (26%) maybe and two (11%) of all the participants answered no (See Figure 16, for an overview)
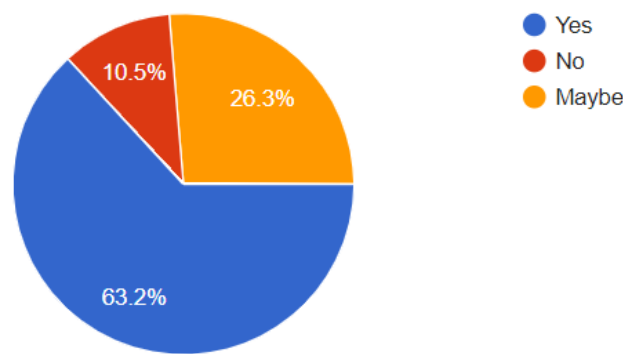
Figure 16: Question from survey

20 responses: Three (15%) agreed, that they mastered the case scenario, eight (40%) were partially in agreement, four (20%) were neutral, and five (25%) partially disagreed.

20 responses: Nine (45%) of the participants agreed that it was easy to stay concentrated throughout the case scenario, three (15%) were partially in agreement, four (20%) were neutral, three (15%) were partially disagree and one (5%) disagreed with this.

19 responses: Four (21.1%) of the participants found the tasks in the e-learning solution made it easier for them to reach a more decisive outcome, ten (52.6%) answered most likely, two (10.5%) was neutral to this, and three (15.8%) answered with low probable.

19 responses: On the question of the use of the e-learning solution provides clear benefits to understand the main case better, four (21.1%) agreed, nine (47.7%) were partially agreed with that, two (10, 5% was neutral, and four (21%) was disagreed.

Control Group:

20 responses: On questions that consisted of five different grades, that this learning process is motivation, four 20% answered yes, very, 13 (65%) answered yes, two (10%) were neutral and one (5%) answered not at all.

20 responses: 18 (90%) responded that they did not dealt with similar case studies before, and two (10%) of respondents answered yes.

20 responses: Six (30%) were agreed, and five (25%) of the participants were partly in agreement that they have got enough information through this learning process, three (15%) were neutral, four (20%) were partially disagreeing about This, and two (10%) disagreed.76

20 responses: 13 (65%) find this learning solution effective for understanding the required material in the book, and seven (35%) maybe.

20 responses: Nine (45%) were agree that It was easy to stay concentrated throughout the case-task in this learning process, five (25%) were partially in agreement, one (5%) was neutral, one (5%) of the participants disagreed, and four (20%) disagreed.

20 responses: With questions about I feel in mastered the case-task; five (25%) were agreed, and five (25%) were partially in agreement, seven (35%) were neutral, two (10%) were partially disagree and one (5%) of the participants disagreed.

20 responses: Questions about if this learning process helps to understand and successfully find optimal solutions to the case task, five (25%) agreed, and six (30%) partially agreed, four (20%) were neutral to this, three (15%) disagreed, and two (10%) of the participants disagreed.

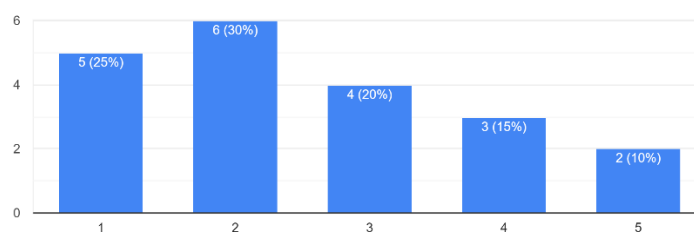Figure 17: Learning experience for control group

User experience

Experiment group:

20 responses; on a question that consists of five different response options, 18 (90%) answered that the e-learning experience is more visual and they can repeat and test themselves several times. 12 (60%) see the benefit of being able to work where they want and whenever they want. And one (5%) answered others.
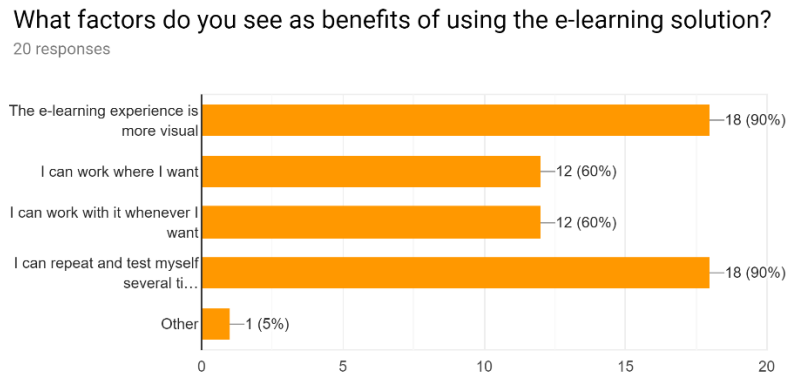
What factors do you see as benefits of using the e-learning solution?
20 responses

Figure 18: Benefits of using the e-learning solution

10 responses: on the question if the participants encountered any of the following technology-related challenges during the testing, four (40%) answered that the program crashed and the program did not respond. Five (50%) stated that the program responded slowly, 14 (70%) of the participants enjoyed when using e-learning technology, four (20%) were neutral, and two (10) did not enjoy.

20 responses: On questions built on a scale of 1-5, where 1 is difficult and 5 is easy, 12 (60%) of the participants answered its easy to navigate the e-learning solution, five (25%) partly easy, two (10%) were neutral and one (5%) was partially difficult.

10 responses: On question if they find difficult with the use of the e-learning solution, two (20%) responded that the design was complicated, three (30%) that its was lots to keep track of. Other comments were provided in the appendix.

20 responses: On questions, with five possible alternatives, where participants could choose several possible alternatives, what made it easy when using the e-learning solution eleven (55%) answered well designed, 13 (65%) answered it was easy to navigate , 17 (85%) registered that there was so much information that once, not distracting answered 12 (60%) of the participants, and 14 (70%) responded that it was a smooth learning experience.

19 responses: 12 (63%) answered that e-learning solution is more beneficial than traditional learning (52.6%) replied that it was more motivating than traditional learning, two (10.5%) answered equal to traditional learning method, five (26.3%) of the participants found that there was an improvement over learning methods used today, and one (5.3%) other.

I feel that this e-learning solution is:
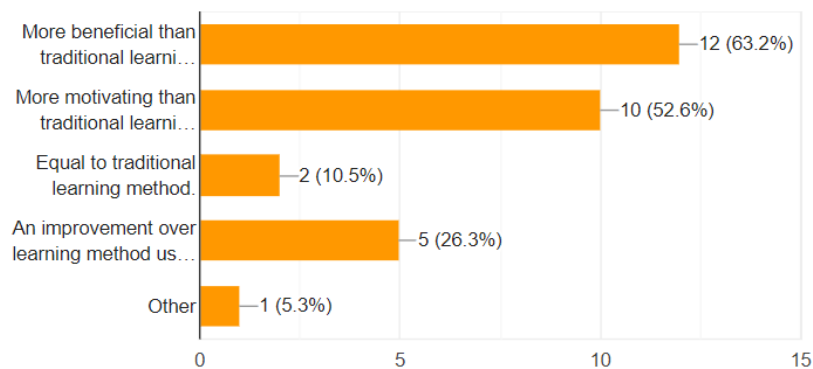
19 responses

Figure 19: User experience for experiment group

20 responses: On the question, if the participants had a positive experience using the e-learning solution, where the answers consisted of scale response options from 1-5, nine (45%) responded yes very, seven (35%) answered yes, two (10 %) were neutral, and two (10%) answered no.

20 responses: Five (25%) responded to the probability that they would use this e-learning solution again, very likely, nine (45%) responded likely, three (15%) were neutral, and three (15%) answered note really.

20 responses: On question; would they rather use this e-learning method over their usual learning method if they had the choice, nine (45%) of the participants answered yes, three (15%) answered no, and eight (40%) answered maybe.

Control group:

18 responses: Question about; could they improve their learning process, eleven (61.1%) responded to option make it more visual, three (16.7%) want different navigation process, nine (50%) want possibility to revisit their task work, and 12 (66.7%) would include more interactive elements.

Figure 20: User experience for control group

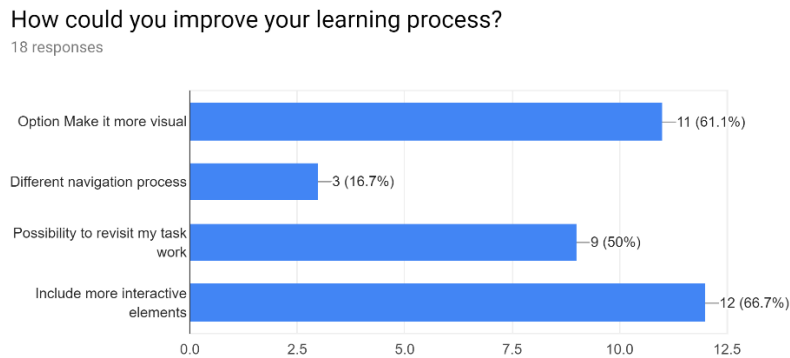**20 responses:** On questions with scale options from 1-5, how easy it was to navigate this solution, five (25%) answered it was easy, six (30%) partly easy, seven (35%) were neutral, two (10%) responded in partly difficult.

20 responses: Five (25%) of respondents responded that they can see benefits when using this solution to understand a case-task better, ten (50%) responded likely to this, four (20%) were neutral and one (5 %) answered low probable.

9 responses: On a question what did you find difficult with the use of this solution, one (11.1%) replied that the design was complicated, seven (77.8%) answered that there were lots to keep track of.

17 responses: On a question what made it easy to use this learning solution, which were bases on five several response options, eight (47.1%) responded that it was well designed, seven (41.2%) that it was easy to navigate, six (35.3%) that it was not too much information that once, 13 (76.5%) were easy to read, and nine (52.9%) of the participants replied that it was not distracting.

20 responses: Four (20%) were very satisfied with this learning solution, ten (50%) were satisfied, four (20%) were neutral, and two (10%) were not satisfied.

19 responses: When asked, do you think an e-learning solution would enhance your effectiveness when you work with such case-task, eleven (57.9%) answered maybe, six (31.6%) answered yes, and two (10.5%) answered no.

20 responses: 16 (80%) of participants would like to access other teaching sources than the book, one (5%) responded maybe, and three (15%) answered no.

17 responses: On questions with multiple answer options, what different types of sources you would like to include, ten (58.8%) chose to include the web, seven (41.2%) articles, 13 (76.5%) YouTube. Other participants comments represented in the appendix.

Summary

The demographic distribution of the respondents, involving the experiment and control groups, was established to have respondents of age groups between 20 and 23 years old (75% of the respondents), 24-26 years (20%) and 27-40 years (5%). This showed that the majority of the respondents were youths below 26 years old for both the control and experiment groups. Notably, the proportion of females and males did not differ significantly, with a representation of 55% and 45% respectively for experiment group; and 45% females and 55% males for the control group. The experiment group had 90% of the respondents using an online platform for their learning. The qualitative data obtained from the survey indicated that perceived learning experience, in terms of improvement, was differentially appreciated amongst the respondents. The majority (60%) of the respondents in the experiment group indicated to obtain better outcomes through e-learning compared to the usual method of learning. For the control group, and in terms of motivation to learn, 65% of the respondents agreed with the view that e-learning motivates learners and thereby improving their learning experience. Further, in terms of the user experience, the respondents indicated that e-learning benefits them in their work, with 60% of the participants agreeing to that. The respondents even reported that they are willing to consider e-learning instead of normal classroom learning, as their learning method of choice. Moreover, various respondents identified several advantages of e-learning, such as improved satisfaction, enhanced effectiveness when working with case-tasks, availability of too much information for the learners, and ease of navigation of solutions. All these findings were linked to the main element in the study, which is digital storytelling.

6 Discussion

In this chapter, a general discussion and interpretation of the collected data and the discussion of the results, presented in **Chapter 5,** are provided. The research questions, and the theories that were described at the beginning of this project, in the introductory chapter, are discussed based on their relevance and justifications using the previous studies, theories and models of teaching and learning used in studies on education. Furthermore, this chapter has two sections and presents the discovery from the various surveys; and the responses to RQ are based on the theoretical basis described in **Chapter 2**. Therefore, this chapter discusses the established new methodology for increasing the decision-making performance of police officers dealing with missing persons by effectively improving the criminal investigative decision-making process. Furthermore, the discussion includes both quantitative and qualitative elements of the study, with the emphasis on the survey results.

6.1 Learning performance

RQ1: *How does digital storytelling improve the learning performance for police students, and could it be used as a complete substitution or a supplementary solution for standard classroom training?*

This study confirmed that learning experience was differentially appreciated, with both experimental group and the control groups undertaking the study. The results showed that the respondents appreciated the benefits of e-learning in their work, with 60% of the participants agreeing to that case from both control and experiment. This was an indication that digital storytelling can supplement the standard classroom teaching. In the previous researches, where England police students (novices) were tested, Fahsing and Ask (2016) found that English police students complied with 28% of investigative hypotheses, while Experiment group registered 45.8 %. This shows that experiment group who had e-learning did better result than students from England. The research from England shows as well that Norwegian experience police officers performed 45%, so its prove that e-learning solution is good teaching tool for police students in acquiring skills for decision making in their investigative work. According

to Fahsing and Ask (2016), English detectives benefit more from their use and engagement in extensive standardized training, synchronized development as well as systematic evaluation; where all these are considered as professional requirements for the police in England.
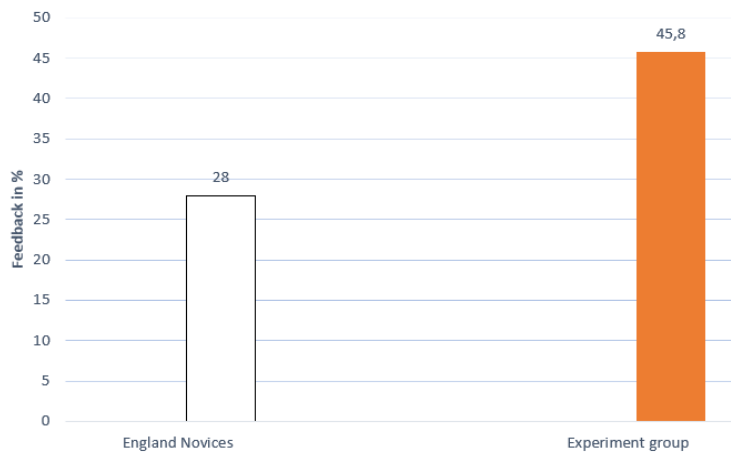
Figure 21: Differences in experience in decision-making between English and Norwegian police officers

Thus, due to lack of such requirements in Norway, it is only appropriate that better strategies for improvement of learning are required for the Norwegian police to conduct their investigative work. Notably, online learning has a critical role in the educational growth, and consequently benefits the learners through improved learning performance (Leal, 2009). In the present study, more than 60% of experiment group answered that they got enough information when they undertook e-learning and only 30% from control group. This finding simply shows that interactive content with digital story telling provides and deliver understandable and good interactive content when students take e-learning as shown in figure 22.

Figure 22: Interactive learning using digital storytelling

The research survey focused on collecting data on and testing of the survey results on how representation e-learning affects the learning process and performance amongst the police students. In the survey, categorization of the study participants (blue for control and orange for e-learning groups) provided the basis for analyzing and interpreting the results. However, of critical i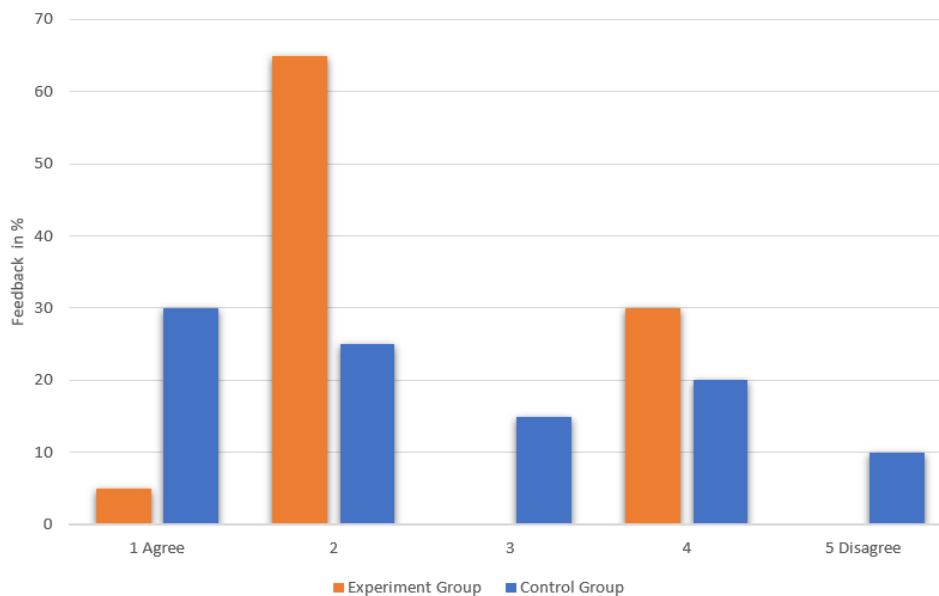mportance was the choice of the statistical tests used to compare the outcomes between the two groups. The undertaken survey, with target group consisting of all respondents between 20-40 years old (see background information and demographic distribution), provided the first relevance of the study in terms of the suitability of the respondents in investigating and determining the best teaching method for police trainees. The analysis of the experiment group provided the education backgrounds (only 5% had bachelor's degree), where 25% of the respondents having little experience in e-learning, while those with average experience in e-learning being 65%, and only 10% of the respondents having considerable experience. The fact that 65% of the respondents had an average experience in e-learning; this has various implications in the possible introduction of digital storytelling as a strategy to improve the learning performance. Using 65% of the respondents and projecting it to represent the overall knowledge and experience in e-learning in the police training, the introduction of the digital storytelling will therefore be undertaken in an already familiar platform, where majority of the target group will appreciate the basis for the introduction of e-learning in their training for improved learning performances.

In Norway, and as early as 1967, the criminal justice and the law enforcement bodies sought the need to incorporate proper training and strengthening strategies to improve the academic requirements so as to produce better police officers to serve the country (Smith & Aamodt 1997). The arguments put forward for the possible changes in the education of the police officers included the changing levels of intelligence amongst the general population in Norway and across the world, and therefore, the police needs to exceed such levels of intelligence exhibited by the general society. This was established from the present research, where the majority of the respondents (control and experimental respondents) showed a high level of intelligence and know-how on the use of e-learning in various trainings. In terms of the learning experience, the experimental and control groups showed varied results. Out of the 20 responses obtained from the experiment group, only 10% (two) of the respondents indicated to have encountered cases of murder, kidnap, runaway, accident, sudden illness and suicide. Various issues could be raised from this finding, including the possible lack of knowledge or know-how on the investigation and dealing with such cases. Notably, majority of the respondents (60%) found the application of e-learning in training of the police to be a more effective teaching and learning approach, especially in case scenarios. Similar results were also established from the respondents' perception of how e-learning will contribute to getting better outcomes compared to the standard practices; where 63% of them associated e-learning with better outcomes in investigating the above cases, while only two respondents rejecting the training and the associated outcome.

In order to appreciation this study's outcomes, it was important to review the previous studies on policing and the general training involving either online (e-training) and the standard (common) education, and the associated benefits on the performance of the learners and police in specific. Smith and Aamodt (1997) investigated the relationship that exists between the education undertaken by the police, their experience and the overall performance. The study investigated the relevance of validity and relevance of education as a predictor in the police performance; where the researcher found that education is a valid predictor. Notably, Smith and Aamodt (1997, p. 53) established that better-educated police officers exhibit and demonstrate high performance in the academy, use less force, have fewer disciplinary issues and miss fewer work days among others. Moreover, police officers who had better qualifications such as college degrees go on in their job to offer better services compared to those who have only high school diploma. All these findings are indications that the introduction of e-learning, and as proved in the research findings, will enable police officers improve on the decision-making performance, particularly in dealing with issues of missing

persons by effectively improving the criminal investigative decisions. Furthermore, the fact that education improves on the cognitive ability of police officers (Andersen and Gustafsberg, 2016; Déverge, 2016). Therefore, with the provisions of e-learning is improving the performance of learners (Chernobilsky & Hayes, 2019; Sun et al., 2008; Derouin et al., 2005), it is important to incorporate e-learning strategies as a way of improving learning amongst the police officers. For example, Derouin et al. (2005) established that e-learning, as an instructional strategy for teaching and learning various skills, knowledge and attitudes in various organizations, is viable, effective and has the potential to ensure that tangible benefits are obtained from employing such a strategy. Similarly, Sadik (2008) established that Egyptian teachers were able to support their learners through engaged student learning. Moreover, Leal (2009) found that technology, such as digital storytelling; help facilitate learning because of the generation in which the learning approach is to be implemented (millennials), who also depend on technology for various activities. Tamim et al. (2011) also found similar results that e-learning helps learners overcome different educational barriers. Based on these previous findings, the findings in the present study therefore supports and confirms the earlier findings on how e-learning can help improve attitudes and the overall learning process amongst the police officers.

Overall, in terms of the learner performance, this study confirmed the earlier findings that e-learning improves on the performance outcome. Phelps et al. (2016) investigated the outcome of experiential learning and training based on simulation in the police education system in Norway. A body-worn video (subcams) and replays of interviews video footage used as a tool that could encourage reflection amongst Norwegian police students. The results from the study showed that the use of technology in the final year of the Norwegian police students training improved their general decision-making and communication (Phelps et al., 2016, p.50). The measurement of the outcomes (decision-making and communication) involved the number of statements that were recorded and reported by the learners on how the use of worn-video helped them improve their learning. Furthermore, Saleem and Rasheed (2014) found that time, technology and workload of the users of technology, particularly the students, have a significant influence on e-learning; whereby, e-learning reduces the time and workload of the learners in undertaking various activities. Moreover, Lam et al. (2011) established that learners who have experience or use technology in their everyday lives developed positivity in learning using the technology as well as the e-learning strategies.

Inasmuch the results of the present study indicate potential benefits on the learning performance of the police, the findings should be appreciated with caution. First, the

methodological and conceptual formulations only suited the Norwegian police students and may not be applicable to other police officers in other jurisdictions and cultures. Therefore, it is only right to apply the findings of this study within the content of the Norwegian police culture, whereby, the police students appreciate technology in their learning and consequently in their work. For example, Owino (2013) found that e-learning did not have a positive impact on the achievement levels amongst the undergraduate learners when the implications of and differences between traditional lectures and e-learning tools were studied. It is only imperative that effective e-learning strategies are implemented to encourage the learners to perceive positively e-learning and the associated benefits. Hence, the findings of this study approves /shows that of the (RQ1) digital storytelling as an approach for enhancing decision-making skills for police officers improve the learning performance when compared to standard classroom methods, either as a complete substitution or a supplementary solution.

6.2 Motivation

RQ2: *How does digital storytelling as an approach, augment and advance the motivation and enhance the learning experience of investigative decision making?*

The above discussions (section 6.1) focused on explaining the different implications of the demographic background information of the respondents, their experience in using technology in learning and the results from the generation and testing of the hypotheses. The learning experience of the police learners (respondents) provided a different dimension in which technology enhances the experience and outcome of learners. With only 10% (two) of the respondents indicating to have handled the investigated cases before this study, it was worth appreciating that 15% of the participants gave the approach a chance and up to 60% of the total respondents approved of the effectiveness of e-learning solution when police officers undertake case scenarios. It was also worth recording up to 89% of the respondents indicating that e-learning solution can possible give better outcomes in actual practice compared to the common methods that police use in the investigation of various cases. Some of the key benefits of using e-learning, which were recorded amongst the respondents include (1) the provision of more visual experience (90% of the respondents), (2) the officers are able to work in any place and where they want (60% of total respondents), (3) the officers can use or work with the digital

storytelling solution whenever they want (60% of respondents), and (4) the officers can repeat and even test themselves several times (90% of the respondents). Behera (2013) provides various benefits and provisions of e-learning to the learners, such as the provisions of individualized instructions that suit the needs, abilities as well as the learning styles/preferences of the individual learners. Since e-learning has such provisions of allowing each learner to benefit from the individualized instructions and ease of access (breaking barriers of time, distance and place), it is evident that introduction of e-learning as the solution to investigative work of the police will improve the performance of the police officers as well as boost and better the outcome of their investigations. Considering the applicability and possibility of incorporating digital storytelling in mobile learning (Wishart, 2018), this justifies the indicated benefit of e-learning where the police officers can repeat and test themselves several times wherever or whenever they are. This would eventually improve their performance as issues of distance or place will no longer hinder their operations or investigative work.

Traditional forms of learning have various challenges starting from their feasibility in the digital era to their effectiveness in training learners who appreciate technology. The introduction of e-learning is thus associated with possible corrective strategies, completely or partially as a solution to the challenges present in the traditional forms of learning. In terms of the learner experience and motivation, Leal (2009) investigated the implications of e-learning and online education in law enforcement training in the future. The results of the study established that most users and learners find e-learning easy to use, there is high level of enjoyment, thinking and decision-making becomes interesting, and thus Leal (2009) recommends the application of e-learning for future training of the law enforcement officers. Since the millennials forms the main component of the society (Maiers, 2017), a projection that can be equated to the society. in Norway and the world at large, the use of technology in their learning would therefore improve their overall experience, their cognitive skills and thereby improve on their decision-making and reflective skills. All these were confirmed by the experiment group during the data collected for this research, where 63% of the respondents (n=19) indicated that e-learning offered them better outcomes compared to the normal methods of studying. In terms of the ease in which e-learning is associated with learning (Leal, 2009), majority of the respondents (52.6% for most likely and 21.1% completely satisfied) in the present study also found the tasks given in the e-learning solution to make their learning easier as well enabling them to reach a more decisive outcome. The control group also confirmed that the use of e-learning is a source of motivation for the learners (85% of the respondents), where

some of the respondents found that e-learning is effective for understanding the required material in the content or book used for learning.

The respondent's experience of using e-learning considering the TAM model, we can have a positive outcome. The respondents answered was registered that (1) the e-learning is well designed (55% of total respondents), (2) the e-learning is easy to navigate (65% of respondents), (3) e-learning is not distracting (60% of total respondents), (4) smooth learning experience (70% of all respondents), and (5) the e-learning is not distracting. When delivered well designed e-learning, its effect students' motivation to learn. Similarly, Tamim et al. (2011) found that e-learning motivates the learners to overcome various education barriers. Furthermore, Rui-Hsin and Lin (2018) showed that the subjective norms, perceived ease of use, and perceived usefulness positively influenced the usage intention of e-learning for police education and training. Similarly, in the present study, 63,2% of all respondens find this e-learning more beneficial than traditional learning, as well 52,6% registerde that this e-lernign is more motiveiting than traditional lerning, only 10,5% state that e-lerning is equal to traditional learning methods. Notably, Kim and Frick (2011), sustenance of the learner motivation requires the use of self-directed e-learning, where the learners benefits from various provisions of e-learning. For example, Kim and Frick (2011) indicate that e-learning provides the learners with (1) the much needed education content that is more critical, relevant and useful to the learners; (2) the use of multimedia or technological presentations is useful in stimulating the interest of the learners; and (3) the social interactions in the learning process with an animated pedagogical agent. All these were confirmed in the present study as shown in the figure below.
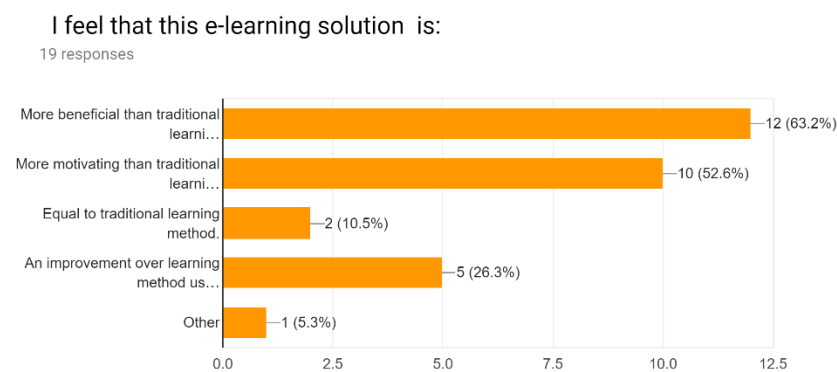

Figure 23: Learner's feeling on using e-learnin

7 Conclusion

In this thesis, the concept of interactive content on better ways to educate and engage Norwegian police cadet through incorporation of digital storytelling was studied, and the findings herein demonstrate the benefits and therefore the need to integrate such technology in the police training at PHS. Currently, the teaching at PHS in a criminal investigation is carried out using more traditional learning methods, most viewed in classrooms. In this regard, police need enhanced strategies, possibly digitalized techniques, to learn investigation processes to develop survey plans, prioritize responses, and optimize decision making. This requires training at a high level of education and learning of structured practices for tactical investigative response and strategic exploratory thinking. Developing e-learning solution in teaching and possibly introduce it to the PHS, where teaching and learning process are integrated with digital storytelling as an approach that will enhance decision-making skills for police officers. Findings from this case study show that e-learning solution improves the learning performance and motivation to learners when they use interactive content. This case study therefore shows that teaching method stimulates thinking and improves learning environment in a classroom. Among the key findings and conclusions that can be made from the study include: (1) Effective use of visual aids substitutes monotonous learning environments; (2) Students develop and increase personal understanding of the areas of learning when they experience a successful and pleasant learning; (3) Students find visual aids sessions useful and relevant when it has some direct relation to the course content; (4) The present research gave insights on students` perception and opinions on the use of visual aids and resources; however, it is also imperative to redirect teachers; (5) Use of interactive content increase and enhance student's motivation when learning process and provide better understanding of the case-task; and (6) Visual aids lead to better understanding the whole content or context that affects the learning performance when compared to standard classroom methods, either as a complete substitution or a supplementary solution.

Overall, this research confirms that digital storytelling will benefit the Norwegian police in conducting effective investigative and decision-making practices on missing people. Moreover, improving the performance and motivation of the police cadets to appreciate investigative work, will go a long way in changing the perception of the public who have been criticizing the police actions on criminal justice involving missing people. Therefore, through introducing a modern and effective training approach, involving integration of digital storytelling in PHS, this study confirms that the police cadets will acquire necessary knowledge and skills that will be retained even after the training. This implies that the present study provides a backstopping for the future improvements of the police cadets in Norway as well as the rest of the world on how technology can be integrated into the training and future work of the police in their investigative works. Moreover, the use of digital storytelling will change the traditional practice in police training programs where instructional technique involved on sharing of personal experience as the strategy to improve on retention and motivation in the work; whereby, specific stories within the investigative content and context will be provided to the learners. In conclusion, the provisions and benefits of digital storytelling in training police cadets is for the benefit of both the public and the police force.

7.1 Future work

In order for the outcome of this case study result, the main aspect for further work should involve participant testing during a long period of time. Furthermore, it will be interesting to implement more visual content based on the reality situation, where the participants can act differently. Thus, future studies should focus on research on:

1. Opportunities for the students to have more flexibility with their using e-learning solution/ course.
2. To conduct survey studies on the persistent reasons and demands for staying in the police training course.

Overall, it will be interesting to make more modules, and to implementer course to the schools LMS.

References

Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: definition, rationale and a call for research. *Higher Education Research & Development*, *34*(1), 1-14. https://www.tandfonline.com/doi/pdf/10.1080/07294360.2014.934336?needAccess=true

Ackermann, E. (2001). Piaget's constructivism, Papert's constructionism: What's the difference. *Future of learning group publication*, *5*(3), 438.

Aduayi-Akue, J., Lotchi, K., Parveen, S., Onatsu, T. & Pehkonen-Elmi. T. (2017). Motivation of online learners. Retrieved from <https://verkkolehdet.jamk.fi/ev-peda/2017/01/25/motivation-of-online-learners/>

Aksit, F., Niemi, H., & Nevgi, A. (2016). Why is active learning so difficult to implement: The Turkish case. *Australian Journal of Teacher Education*, *41*(4), 6.

Alajmi, M. (2009, October). E-learning and ADDIE Model. In *E-Learn: World Conference on E-Learning in Corporate, Government, Healthcare, and Higher Education* (pp. 37-42). Association for the Advancement of Computing in Education (AACE).

Al-Qahtani, A. A., & Higgins, S. E. (2013). Effects of traditional, blended and e-learning on students' achievement in higher education. *Journal of computer assisted learning*, *29*(3), 220-234.

Amory, A. (2012). Instructivist ideology: Education technology embracing the past?. *Interactive Learning Environments*, *20*(1), 41-55.

Andersen, J. P., & Gustafsberg, H. (2016). A training method to improve police use of force decision making: a randomized controlled trial. *Sage Open*, *6*(2), 2158244016638708.

Andresen, B. B., & van den Brink, K. (2002). Multimedia in education. In *Infarmation technologies at school: conference materials* (pp. 5-8).

REFERENCES

Arbaugh, J. B., & Duray, R. (2002). Technological and structural characteristics, student learning and satisfaction with web-based courses: An exploratory study of two on-line MBA programs. *Management learning*, *33*(3), 331-347.

Bada, S. O., & Olusegun, S. (2015). Constructivism learning theory: A paradigm for teaching and learning. *Journal of Research & Method in Education*, *5*(6), 66-70.

Bandura, A. (2010). Self-efficacy. *The Corsini encyclopedia of psychology*, 1-3.

Behera, S. K. (2013). E-and M-Learning: A comparative study. *International Journal on New Trends in Education and Their Implications*, *4*(3), 65-78.

Bell, B. S., & Federman, J. E. (2013). E-learning in postsecondary education. *The future of children*, 165-185

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, *2*, 8-14.

Bennell, C., Bloomfield, S., Snook, B., Taylor, P., & Barnes, C. (2010). Linkage analysis in cases of serial burglary: Comparing the performance of university students, police professionals, and a logistic regression model. *Psychology, Crime & Law*, *16*(6), 507-524.

BinSubaih, A., Maddock, S., & Romano, D. (2009). Developing a serious game for police training. In *Handbook of research on effective electronic gaming in education* (pp. 451-477). IGI Global.

Branch, R. M. (2009). *Instructional design: The ADDIE approach* (Vol. 722). Springer Science & Business Media.

Brocato, B. R., Bonanno, A., & Ulbig, S. (2015). Student perceptions and instructional evaluations: A multivariate analysis of online and face-to-face classroom settings. *Education and Information Technologies*, *20*(1), 37-55.

Bromberg, N. R., Techatassanasoontorn, A. A., & Andrade, A. D. (2013). Engaging students: Digital storytelling in information systems learning. *Pacific Asia Journal of the Association for Information Systems*, *5*(1).

Burmark, L. (2004). Visual Presentations That Prompt, Flash & Transform Here are some great ways to have more visually interesting class sessions. *Media and methods*, *40*, 4-5.

Butler, J. (2012). *Subjects of desire: Hegelian reflections in twentieth-century France*. Columbia University Press.

Canavan, J. (2004). Personalised e-learning through learning style aware adaptive systems. http://www.tara.tcd.ie/bitstream/handle/2262/1218/?sequence=1

Cassidy*, S. (2004). Learning styles: An overview of theories, models, and measures. *Educational psychology*, *24*(4), 419-444.

Cercone, K. (2008). Characteristics of adult learners with implications for online learning design. *AACE journal*, *16*(2), 137-159.

Chernobilsky, E., & Hayes, S. (2019). Utilizing Learning Analytics in Small Institutions: A Study of Performance of Adult Learners in Online Classes. In *Utilizing Learning Analytics to Support Study Success* (pp. 201-220). Springer, Cham.

Coates, H., James, R., & Baldwin, G. (2005). A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary education and management*, *11*, 19-36.

Coffield, F., Moseley, D., Hall, E., & Ecclestone, K. (2004). Learning styles and pedagogy in post-16 learning: A systematic and critical review.

Conlan, O., Wade, V., Bruen, C., & Gargan, M. (2002, May). Multi-model, metadata driven approach to adaptive hypermedia services for personalized elearning. In *International Conference on Adaptive Hypermedia and Adaptive Web-Based Systems* (pp. 100-111). Springer, Berlin, Heidelberg.

Conneeley, A. L. (2002). Methodological issues in qualitative research for the researcher/practitioner. *British Journal of Occupational Therapy*, *65*(4), 185-190.

Danish, S. J. (2002). Teaching life skills through sport. *Paradoxes of youth and sport*, 49-60.

Danish, S. J., & Donohue, T. (1995). Understanding media's influence on the development of antisocial and prosocial behavior. *Preventing violence in America*, *4*, 133-155.

Danish, S. J., & Nellen, V. C. (1997). New roles for sport psychologists: Teaching life skills through sport to at-risk youth. *Quest*, *49*(1), 100-113.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS quarterly*, 319-340.

De, B. (2018). Traditional learning Vs. Online learning. https://elearningindustry.com/traditional-learning-vs-online-learning

Deci, E. L., & Ryan, R. M. (1985). The general causality orientations scale: Self-determination in personality. *Journal of research in personality*, *19*(2), 109-134.

Denscombe, M. (2008). Communities of practice: A research paradigm for the mixed methods approach. *Journal of mixed methods research*, *2*(3), 270-283.

Derouin, R. E., Fritzsche, B. A., & Salas, E. (2005). E-learning in organizations. *Journal of Management*, *31*(6), 920-940.

Déverge, C. A. (2016). Police education and training: A comparative analysis of law enforcement preparation in the United States and Canada.

Dörner, R., Grimm, P., & Abawi, D. F. (2002). Synergies between interactive training simulations and digital storytelling: a component-based framework. *Computers & Graphics*, *26*(1), 45-55.

Eady, M., & Lockyer, L. (2013). Tools for learning: Technology and teaching. *Learning to teach in the primary school*, *71*.

REFERENCES

Edwards, J., & Roblyer, M. D. (2000). Integrating educational technology into teaching. *Merill, Upper Saddler river, NJ*.

Ekanayake, S. Y., & Wishart, J. (2015). Integrating mobile phones into teaching and learning: A case study of teacher training through professional development workshops. *British Journal of Educational Technology*, *46*(1), 173-189.

Ertmer, P. A., & Newby, T. J. (2013). Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance improvement quarterly*, *26*(2), 43-71.

European Commission (EC), (2013). Annual report: 250.000 children are reported missing in Europe every year, 1 child every 2 minutes. http://missingchildreneurope.eu/Portals/0/Docs/Missing%20Children%20Europe%20Annual%20Report%202013.pdf

Facione, P. (1990). Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction (The Delphi Report).

Fahsing, I., & Ask, K. (2016). The making of an expert detective: The role of experience in English and Norwegian police officers' investigative decision-making. *Psychology, Crime & Law*, *22*(3), 203-223.

Feng, J. Y., Chang, Y. T., Chang, H. Y., Erdley, W. S., Lin, C. H., & Chang, Y. J. (2013). Systematic review of effectiveness of situated e-learning on medical and nursing education. *Worldviews on Evidence-Based Nursing*, *10*(3), 174-183.

Fishbein, M., & Ajzen, I. (1976). Misconceptions about the Fishbein model: Reflections on a study by Songer-Nocks. *Journal of Experimental Social Psychology*, *12*(6), 579-584.

Garavan, T. N., Carbery, R., O'Malley, G., & O'Donnell, D. (2010). Understanding participation in e-learning in organizations: a large-scale empirical study of employees. *International Journal of Training and Development*, *14*(3), 155-168.

Gimeno-Sanz, A. (2015). Digital Storytelling as an innovative element in English for Specific Purposes. *Procedia-Social and Behavioral Sciences*, *178*, 110-116.

REFERENCES

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The qualitative report*, *8*(4), 597-606.

Graf, S., & Kinshuk, K. (2006a). Considering learning styles in learning management systems: Investigating the behavior of students in an online course. In *2006 First International Workshop on Semantic Media Adaptation and Personalization (SMAP'06)* (pp. 25-30). IEEE.

Graf, S., & Kinshuk, P. (2006b). An approach for detecting learning styles in learning management systems. In *Sixth IEEE International Conference on Advanced Learning Technologies (ICALT'06)* (pp. 161-163). IEEE.

Gustafson, K. L., & Branch, R. M. (2002). What is instructional design. *Trends and issues in instructional design and technology*, 16-25.

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of educational research*, *77*(1), 81-112.

Helyer, R. (2015). Learning through reflection: the critical role of reflection in work-based learning (WBL). *Journal of Work-Applied Management*, *7*(1), 15-27.

Heo, M. (2009). Digital storytelling: An empirical study of the impact of digital storytelling on pre-service teachers' self-efficacy and dispositions towards educational technology. *Journal of Educational Multimedia and Hypermedia*, *18*(4), 405-428.

Hopf, Y. M., Francis, J., Helms, P. J., Haughney, J., & Bond, C. (2016). Core requirements for successful data linkage: an example of a triangulation method. *BMJ open*, *6*(10), e011879.

Hsu, C. K., Hwang, G. J., & Chang, C. K. (2013). A personalized recommendation-based mobile learning approach to improving the reading performance of EFL students. *Computers & Education*, *63*, 327-336.

Huang, W. D., & Johnson, T. (2011). Instructional game design using cognitive load theory. In *Instructional Design: Concepts, Methodologies, Tools and Applications* (pp. 1586-1606). IGI Global.

REFERENCES

ICRC, I. (2003). Report: The Missing and Their Families. https://www.icrc.org/eng/resources/documents/report/5jahr8.htm

Jakes, D. S., & Brennan, J. (2005). Capturing stories, capturing lives: An introduction to digital storytelling. *Retrieved January*, *16*, 2011.

Jonassen, D. H. (2000). *Computers as mindtools for schools: Engaging critical thinking*. Prentice hall.

Kalyuga, S. (2011). Cognitive load theory: How many types of load does it really need?. *Educational Psychology Review*, *23*(1), 1-19.

Khalil, M. K., & Elkhider, I. A. (2016). Applying learning theories and instructional design models for effective instruction. *Advances in physiology education*, *40*(2), 147-156.

Kibria, G. (2014). What are the advantages and challenges of online learning and teaching. *Retrieved July*, *2*, 2014.

Kim, K. J., & Frick, T. W. (2011). Changes in student motivation during online learning. *Journal of Educational Computing Research*, *44*(1), 1-23.

Kim, K. J., Liu, S., & Bonk, C. J. (2005). Online MBA students' perceptions of online learning: Benefits, challenges, and suggestions. *The Internet and Higher Education*, *8*(4), 335-344.

Knowles, M. S., & associates. (1984). Andragogy in action. Jossey-Bass San Francisco.

Kolb, D. A., & Fry, R. E. (1974). *Toward an applied theory of experiential learning*. MIT Alfred P. Sloan School of Management.

Koohang, A., Riley, L., Smith, T., & Schreurs, J. (2009). E-learning and constructivism: From theory to application. *Interdisciplinary Journal of E-Learning and Learning Objects*, *5*(1), 91-109.

REFERENCES

Koper, C. S., Lum, C., & Willis, J. J. (2014). Optimizing the use of technology in policing: Results and implications from a multi-site study of the social, organizational, and behavioural aspects of implementing police technologies. *Policing: A Journal of Policy and Practice*, *8*(2), 212-221.

Kotluk, N., & Kocakaya, S. (2017). The Effect of Creating Digital Storytelling on Secondary School Students' Academic Achievement, Self Efficacy Perceptions and Attitudes toward Physics. *International Journal of Research in Education and Science*, *3*(1), 218-227.

Kumar, R. (2019). *Research methodology: A step-by-step guide for beginners*. Sage Publications Limited.

Kurniawan, S. (2004). Interaction design: Beyond human–computer interaction by Preece, Sharp and Rogers (2001), ISBN 0471492787.

Lam, P., Lee, J., Chan, M., & McNaught, C. (2011, March). Students' use of eLearning strategies and their perceptions of eLearning usefulness. In *Global Learn* (pp. 1379-1388). Association for the Advancement of Computing in Education (AACE).

Leal, J. (2009). E-learning and online education: implications for the future of law enforcement training. *World Future Review*, *1*(3), 22-28.

Lisenbee, P. S., & Ford, C. M. (2018). Engaging students in traditional and digital storytelling to make connections between pedagogy and children's experiences. *Early Childhood Education Journal*, *46*(1), 129-139.

Lutz, M., & Ascher, D. (2004). *Learning Python*. Sebastopol, CA: O'Reilly.

Lyashenko, M. S., & Frolova, N. H. (2014). LMS projects: A platform for intergenerational e-learning collaboration. *Education and Information Technologies*, *19*(3), 495-513.

Maiers, M. (2017). Our future in the hands of Millennials. *The Journal of the Canadian Chiropractic Association*, *61*(3), 212.

Markham, S. (2000). Learning Styles measurement: a cause for concern. *Learning*, *9*.

Martinez, J. (2017). The Best eLearning Authoring Tools of 2017. https://au.pcmag.com/cloud-services-1/43929/the-best-elearning-authoring-tools

Masrom, M. (2007). Technology acceptance model and e-learning. *Technology*, *21*(24), 81.

McDermott, P. J., & Hulse, D. (2012). Interpersonal skills training in police academy curriculum. *FBI L. Enforcement Bull.*, *81*, 16.

McGee, P. (2014). *The instructional value of digital storytelling: Higher education, professional, and adult learning settings*. Routledge.

Mohajan, H. K. (2017). Two criteria for good measurements in research: Validity and reliability. *Annals of Spiru Haret University. Economic Series*, *17*(4), 59-82.

Møller-Stray, D., & Haugland, E. B. (2017). *E-learning in corporate training using interactive courses* (Master's thesis, Universitetet i Agder; University of Agder).

Nguyen, A. (2011). *Negotiations and challenges in creating a digital story: The experience of graduate students* (Doctoral dissertation).

Niemiec, C. P., & Ryan, R. M. (2009). Autonomy, competence, and relatedness in the classroom: Applying self-determination theory to educational practice. *School Field*, *7*(2), 133-144.

Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence-based nursing*, *18*(2), 34-35.

Owino, O. (2013). The impact of e-learning on academic performance: A case study of group learning sets. *Unpublished Masters Project. University of Nairobi*.

Paul, R., & Elder, L. (1999). *Critical thinking: Basic theory & instructional structures*. Foundation for Critical Thinking.

Phelps, J. M., Strype, J., Le Bellu, S., Lahlou, S., & Aandal, J. (2016). Experiential learning and simulation-based training in Norwegian police education: Examining body-worn

video as a tool to encourage reflection. *Policing: a journal of policy and practice*, *12*(1), 50-65.

Pintrich, P. R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary educational psychology*, *25*(1), 92-104.

Pitler, H. J. (2006). Viewing technology through three lenses. *PRINCIPAL-ARLINGTON-*, *85*(5), 38.

Pratt, D. D. (1993). Andragogy after twenty-five years. *New directions for adult and continuing education*, *57*(57), 15-23.

Quigley, D. J. (2018). *Inter-Professional Practice to Support Effective Language Enrichment in Primary School Classrooms: An Action Research Inquiry* (Doctoral dissertation, Trinity College Dublin).

Race, P. (2001). *The lecturer's toolkit: a practical guide to learning, teaching & assessment*. Psychology Press.

Race, P. (2013). *The lecturer's toolkit: a practical guide to assessment, learning and teaching*. Routledge.

Range, B., Duncan, H., & Hvidston, D. (2013). How faculty supervise and mentor pre-service teachers: Implications for principal supervision of novice teachers. *International Journal of Educational Leadership Preparation*, *8*(2), 43-58.

Robin, B. (2016). The power of digital storytelling to support teaching and learning. *Digital Education Review*, (30), 17-29.

Robin, B. R. (2008). Digital storytelling: A powerful technology tool for the 21st century classroom. *Theory into practice*, *47*(3), 220-228.

Rosewell, J. (2005). Learning styles. *Times Educ. Suppl*, (4659), 11-14.

Ross, A. (2009). Modern interpretations of sustainable development. *Journal of law and society*, *36*(1), 32-54.

Rotherham, A. J., & Willingham, D. T. (2010). 21st-Century" skills. *American Educator*, *17*(1), 17-20.

Rowley, J. (2002). Using case studies in research. *Management research news*, *25*(1), 16-27.

Rui-Hsin, K., & Lin, C. T. (2018). The usage intention of e-learning for police education and training. *Policing: An International Journal*, *41*(1), 98-112.

Ryan, R. M., & Deci, E. L. (2000a). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary educational psychology*, *25*(1), 54-67.

Ryan, R. M., & Deci, E. L. (2000b). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American psychologist*, *55*(1), 68.

Sadik, A. (2008). Digital storytelling: A meaningful technology-integrated approach for engaged student learning. *Educational technology research and development*, *56*(4), 487-506.

Saleem, M.A. & Rasheed, I. (2014) Use of E-learning and its Effect on students. *New Media and Mass Communication*. Vol. 26, 47-51.

Salkind, N. J. (Ed.). (2010). *Encyclopedia of research design*(Vol. 3). Sage.

Savery, J. R., & Duffy, T. M. (1994). Problem based learning: An instructional model and its constructivist framework.

Schunk, D. H., & Zimmerman, B. (Eds.). (2011). *Handbook of self-regulation of learning and performance*. Taylor & Francis.

Scott, J. L., Moxham, B. J., & Rutherford, S. M. (2014). Building an open academic environment–a new approach to empowering students in their learning of anatomy through 'S hadow M odules'. *Journal of anatomy*, *224*(3), 286-295.

Scott, M. S. (2003). Getting the police to take problem-oriented policing seriously. *Crime prevention studies*, *15*, 49-78.

Smeda, N., Dakich, E., & Sharda, N. (2014). The effectiveness of digital storytelling in the classrooms: a comprehensive study. *Smart Learning Environments*, *1*(1), 6.

Smith, S. M., & Aamodt, M. G. (1997). The relationship between education, experience, and police performance. *Journal of Police and Criminal Psychology*, *12*(2), 7-14.

Sparrow, M. K. (2015). Measuring performance in a modern police organization. *Psychosociological Issues in Human Resource Management*, *3*(2), 17-52.

Spector, J. M., Merrill, M. D., Elen, J., & Bishop, M. J. (Eds.). (2014). *Handbook of research on educational communications and technology* (pp. 413-424). New York, NY: Springer.

Sun, P. C., Tsai, R. J., Finger, G., Chen, Y. Y., & Yeh, D. (2008). What drives a successful e-Learning? An empirical investigation of the critical factors influencing learner satisfaction. *Computers & education*, *50*(4), 1183-1202.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive science*, *12*(2), 257-285.

Sweller, J. (1994). Cognitive load theory, learning difficulty, and instructional design. *Learning and instruction*, *4*(4), 295-312.

Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What forty years of research says about the impact of technology on learning: A second-order meta-analysis and validation study. *Review of Educational research*, *81*(1), 4-28.

Thaggard, T. (2003). *Systematics and empathy, 2, edition*. Bergen: Fagbokforlaget.

REFERENCES

Van Eerde, W., & Thierry, H. (1996). Vroom's expectancy models and work-related criteria: A meta-analysis. *Journal of applied psychology*, *81*(5), 575.

Van Nuland, H. J., Taris, T. W., Boekaerts, M., & Martens, R. L. (2012). Testing the hierarchical SDT model: The case of performance-oriented classrooms. *European Journal of Psychology of Education*, *27*(4), 467-482.

Weegar, M. A., & Pacis, D. (2012). A Comparison of two theories of learning-behaviorism and constructivism as applied to face-to-face and online learning. In *Proceedings e-leader conference, Manila*.

White, R. W. (1959). Motivation reconsidered. Psychological Review, 66, 297–333.

Wildman, T. M., & Burton, J. K. (1981). Integrating learning theory with instructional design. *Journal of Instructional Development*, *4*(3), 5.

Wilson, B. G. (1995). Metaphors for instruction: Why we talk about learning environments. *Educational Technology-Saddle Brook NJ-*, *35*, 25-25.

Wishart, J. (2018). Ethical considerations in the incorporation of mobile and ubiquitous technologies into teaching and learning in educational contexts. In *Mobile and Ubiquitous Learning* (pp. 81-93). Springer, Singapore.

Wood, E.J (2004) Problem-Based Learning: Exploiting Knowledge of how People Learn to Promote Effective Learning. *Journal Bioscience Education, 3(1), 1-12*.

Woodgate, D. (2018, September). Foresight as a Tool for Increasing Creativity in the Age of Technology-Enhanced Learning. In *International Conference on Telecommunications* (pp. 21-35). Springer, Cham.

Wu, D., Hiltz, S. R., & Bieber, M. (2010). Acceptance of educational technology: field studies of asynchronous participatory examinations. *Communications of the Association for Information Systems*, *26*(1), 21.

Yang, Y. T. C., & Chou, H. A. (2008). Beyond critical thinking skills: Investigating the relationship between critical thinking skills and dispositions through different online instructional strategies. *British Journal of Educational Technology*, *39*(4), 666-684.

Yang, Y. T. C., & Wu, W. C. I. (2012). Digital storytelling for enhancing student academic achievement, critical thinking, and learning motivation: A year-long experimental study. *Computers & education*, *59*(2), 339-352.

Yeh, Y. C. (2009). Integrating e-learning into the Direct-instruction Model to enhance the effectiveness of critical-thinking instruction. *Instructional Science*, *37*(2), 185-203.

Yin, R. K. (2002). Case study research: Design and methods. Thousand Oaks, CA: SAGE Publications.

Zare, M., & Sarikhani, R. (2016). From E-learning to Ubiquitous learning; Theoretical principles. *Future of medical education journal*, *6*(3), 12-15.

Zare, M., Pahl, C., Rahnama, H., Nilashi, M., Mardani, A., Ibrahim, O., & Ahmadi, H. (2016). Multi-criteria decision making approach in E-learning: A systematic review and classification. *Applied Soft Computing*, *45*, 108-128.

Zhang, D., Zhao, J. L., Zhou, L., & Nunamaker Jr, J. F. (2004). Can e-learning replace classroom learning?. *Communications of the ACM*, *47*(5), 75-79.

Zimmerman, B. J., & Schunk, D. H. (Eds.). (2001). *Self-regulated learning and academic achievement: Theoretical perspectives*. Routledge.

Appendix A

NSD Form

NSD NORSK SENTER FOR FORSKNINGSDATA

Meldeskjema 504873

Sist oppdatert

06.03.2019

Hvilke personopplysninger skal du behandle?

- Lydopptak av personer

Type opplysninger

Skal du behandle særlige kategorier personopplysninger eller personopplysninger om straffedommer eller lovovertredelser?

Nei

Prosjektinformasjon

Prosjekttittel

Investigative decision making: the use of digital storytelling in e-learning for training police officers.

Prosjektbeskrivelse

It a master thesis project, we going to make a new training program for investigative decision making.

Fagfelt

Teknologi

Dersom opplysningene skal behandles til andre formål enn behandlingen for dette prosjektet, beskriv hvilke

Nei

Begrunn behovet for å behandle personopplysningene

Fødselsdato: Vi trenger ikke hele fødselsdato, bare alder for å kunne sammenligne de forskjelige alders gruppenes resultater.
Lydopptak: Vi trenger lydopptak for intervjuer av deltakerene.
Navn trenges for samtykke skjemma.

Ekstern finansiering

Type prosjekt

Studentprosjekt, masterstudium

Kontaktinformasjon, student

Olha, olhaa10@uia.no, tlf: 45474300

Behandlingsansvar

Behandlingsansvarlig institusjon

Universitetet i Agder / Fakultet for teknologi og realfag / Institutt for informasjons- og kommunikasjonsteknologi

Prosjektansvarlig (vitenskapelig ansatt/veileder eller stipendiat)

Aleksandra Lazareva, aleksandra.lazareva@uia.no, tlf: 38142309

Skal behandlingsansvaret deles med andre institusjoner (felles behandlingsansvarlige)?

Nei

Utvalg 1

Personopplysninger for utvalg 1

Utvalg 2

Personopplysninger for utvalg 2

Tredjepersoner

Skal du behandle personopplysninger om tredjepersoner?

Nei

Dokumentasjon

Hvordan dokumenteres samtykkene?

- Manuelt (papir)

Hvordan kan samtykket trekkes tilbake?

Gir beskjed til oss muntlig at deltakeren ønsker å trekke tilbake samtykket.

Totalt antall registrerte i prosjektet

1-99

Tillatelser

Skal du innhente følgende godkjenninger eller tillatelser for prosjektet?

Behandling

Hvor behandles opplysningene?

- Private enheter

Hvem behandler/har tilgang til opplysningene?

- Prosjektansvarlig
- Student (studentprosjekt)
- Databehandler

Hvilken databehandler har tilgang til opplysningene?

Survey

Tilgjengeliggjøres opplysningene utenfor EU/EØS til en tredjestat eller internasjonal organisasjon?

Nei

Sikkerhet

Oppbevares personopplysningene atskilt fra øvrige data (kodenøkkel)?

Ja

Hvilke tekniske og fysiske tiltak sikrer personopplysningene?

- Opplysningene anonymiseres

Varighet

Prosjektperiode

27.08.2018 - 01.06.2019

Skal data med personopplysninger oppbevares utover prosjektperioden?

Nei, alle data slettes innen prosjektslutt

Vil de registrerte kunne identifiseres (direkte eller indirekte) i oppgave/avhandling/øvrige publikasjoner fra prosjektet?

Nei

Tilleggsopplysninger

Appendix B

Request for participation in research project

Forespørsel om deltakelse i forskningsprosjektet

*Investigative decision making: the use of
storytelling in e-learning for training police students*

Jeg er student fra Universitet i Agder som arbeider med en mastergrad innen Multimedia og læringsteknologi. Jeg har utviklet en løsning og ønsker teste denne på politi studenter ved politihøgskolen. I denne forskningen skal jeg undersøke hvordan digital løsning fungerer i forhold til den tradisjonelle læringsmetoden.

Jeg vil gjerne høre om din opplevelse ved bruk av løsningen og ønsker å vite om den kan fungere for deg. Jeg ønsker om at du kunne bruke løsningen, deretter svare på noen spørsmål.

Ved å delta i denne undersøkelsen godkjenner du at informasjon som blir oppgitt kan brukes i forbindelse med forskningsprosjektet og kan publiseres. Alle personopplysninger vil bli behandlet konfidensielt. Basert på svarene du avlegger i undersøkelsene, vil det ikke være mulig å identifisere deg i publikasjoner. Prosjektet skal etter planen avsluttes 15.06.2019. Personopplysninger og opptak vil da bli slettet. Det er frivillig å delta i studien, og du kan når som helst trekke ditt samtykke uten å oppgi noen grunn.

Jeg setter pris på din deltagelse i prosjektet

Jeg har mottatt informasjon om studien, og ønsker delta i forskningsprosjektet

---

(Signert av prosjektdeltaker, dato)

Appendix C

Survey Experiment group

Questionnaire survey (technology group)

Background information

1. **Have you been using e-learning technology during your studies?**
   Mark only one oval.

   ( ) Yes

   ( ) No

   ( ) If yes, which

2. **Do you have any other higher education?**
   Check all that apply.

   [ ] Yes, I have a Bachelor degree

   [ ] Yes, I have a Master degree

   [ ] No, I do not have any of those

3. **Gender**
   Mark only one oval.

   ( ) Female

   ( ) Male

4. **How can you describe your previous experience with e-learning?**
   Mark only one oval.

   ( ) Little experience

   ( ) Average experience

   ( ) Considerable experience

5. **Age**

   _____

Learning experience of the case scenario

6. **Do you think you got better outcomes by using this e-learning solution compared to your usual method of studying?**
   Mark only one oval.

   ( ) Yes

   ( ) No

   ( ) Maybe

7. **Did the tasks in the e-learning solution made it easier for you to reach a more decisive outcome?**

   Mark only one oval.

	1	2	3	4	5	
Low Probable	◯	◯	◯	◯	◯	Very likely

8. **Did you find this e - learning solution more effective in undertaking this case scenario?**

   Mark only one oval.

   ◯ Yes

   ◯ No

   ◯ Maybe

9. **I felt I got enough information through this e-learning lecture**

   Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

10. **Have you dealt with similar case studies before?**

    Mark only one oval.

    ◯ Yes

    ◯ No

11. **It was easy to stay concentrated throughout the case scenario in my learning process**

    Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

12. **I find this e - learning solution more effective in undertaking this case scenario**

    Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

13. **Did the usage of the e-learning solution provide clear benefits to understand the main case better?**

    Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

14. **I feel I mastered the case- scenario**

Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

Experience of the e-learning solution

15. **What did you find difficult with the use of the e-learning solution?**

Check all that apply.

☐ The design was complicated

☐ Hard to navigate

☐ Lots to keep track of.

☐ Other

☐ Other: _____

16. **What is the probability that you would use this e-learning solution again**

Mark only one oval.

	1	2	3	4	5	
Very likely	◯	◯	◯	◯	◯	Never again

17. **Would you rather use this e-learning method over your usual learning method if you had the choice?**

Mark only one oval.

◯ Yes

◯ No

◯ Maybe

18. **I feel that this e-learning solution is:**

Check all that apply.

☐ More beneficial than traditional learning method. (or you use: the current)

☐ More motivating than traditional learning method. skala

☐ Equal to traditional learning method.

☐ An improvement over learning method used today.

☐ Other

19. **How easy was it to navigate the e-learning solution?**

Mark only one oval.

	1	2	3	4	5	
Difficult	◯	◯	◯	◯	◯	Easy

20. **What made it easy to use the e-learning solution?**
Check all that apply.

- [ ] Well designed
- [ ] Easy to navigate
- [ ] Not too much information at once
- [ ] Not distracting
- [ ] Smooth learning experience
- [ ] Other: _____

21. **I enjoyed using e learning technology during the learning process**
Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

22. **Have you encountered any of the following technology-related challenges during the testing?**
Check all that apply.

- [ ] The program crashed
- [ ] Internet issues
- [ ] The program didn't respond
- [ ] The program responded slowly
- [ ] Other

23. **I had a positive experience using the e-learning solution**
Mark only one oval.

	1	2	3	4	5	
Yes, very	◯	◯	◯	◯	◯	No, not at all

24. **What factors do you see as benefits of using the e-learning solution?**
Check all that apply.

- [ ] The e-learning experience is more visual
- [ ] I can work where I want
- [ ] I can work with it whenever I want
- [ ] I can repeat and test myself several times.
- [ ] Other

Appendix D

Survey Control group

Questionnaire

Background information

1. **Age**

_____

2. **Gender**
   Mark only one oval.

   ◯ Female

   ◯ Male

3. **Do you have any other higher education?**
   Check all that apply.

   ☐ Yes, I have a Bachelor degree

   ☐ Yes, I have a Master degree

   ☐ No, I do not have any of those

Your experience of learning from the book

4. **Do you feel this learning process are motivating?**
   Mark only one oval.

	1	2	3	4	5	
Not at all	◯	◯	◯	◯	◯	Yes, very

5. **Have you dealt with similar case studies before?**
   Mark only one oval.

   ◯ Yes

   ◯ No

6. **I felt I got enough information through this learning process**
   Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

7. **Did you find this learning solution effective for understanding the required materiel in the book?**

   Mark only one oval.

   ◯ Yes

   ◯ No

   ◯ Maybe

8. **It was easy to stay concentrated throughout the case-task in my learning process**

   Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

9. **I feel I mastered the case-task**

   Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

10. **I feel the way we undertake case-task learning is very effective?**

    Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

11. **This learning process helps me to understand and successfully find optimal solutions to the case-task.**

    Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

Your experience of this learning solution

12. **How could you improve your learning process?**

    Check all that apply.

    ☐ Option Make it more visual

    ☐ Different navigation process

    ☐ Possibility to revisit my task work

    ☐ Include more interactive elements

    ☐ Other: _____

13. **How easy was it to navigate this solution**
    Mark only one oval.

	1	2	3	4	5	
Difficult	◯	◯	◯	◯	◯	Easy

14. **I can see benefits for me by using the this solution to understand a case-task better**
    Mark only one oval.

	1	2	3	4	5	
Low Probable	◯	◯	◯	◯	◯	Very Likely

15. **What did you find difficult with the use of this solution?**
    Check all that apply.

    ☐ The design was complicated

    ☐ Hard to navigate

    ☐ Lots to keep track of

    ☐ Dificult to read

    ☐ Difficult to understand

    ☐ Other: _____

16. **What made it easy to use this learning solution?**
    Check all that apply.

    ☐ Well designed

    ☐ Easy to navigate

    ☐ Not too much information at once

    ☐ Easy to read

    ☐ Not distracting

    ☐ Other: _____

17. **I feel I received enough information through this solution**
    Mark only one oval.

	1	2	3	4	5	
Agree	◯	◯	◯	◯	◯	Disagree

18. **Are you satisfied with this learning process?**
    Mark only one oval.

	1	2	3	4	5	
Yes, very	◯	◯	◯	◯	◯	No, not at all

19. **Do you think an e-learning solution would enhance your effectiveness when you are working with such case-task ?**

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

20. **Do you think you would have had a better learning outcome if you were offered more flexibility on where and how to learn this? If your answer is yes what would make it more flexible**

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe
- ◯ If yes, left your comment here

21. **Would you like access to other teaching sources than the book ?**

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe

22. **What different types of teaching sources would you like to included?**

Check all that apply.

- ☐ The web
- ☐ Articles
- ☐ YouTube
- ☐ Other: _____

Appendix E

Survey Summary (Experiment group)

Background information
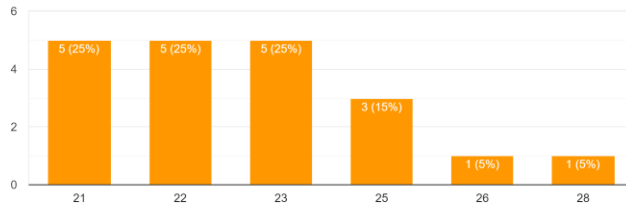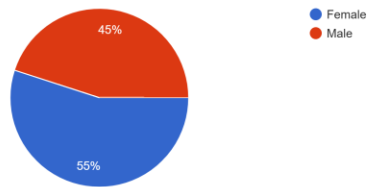
Age
20 responses

Gender
20 responses

- Female
- Male

45%

55%

Do you have any other higher education?
20 responses

Yes, I have a Bachelor degree	1 (5%)
Yes, I have a Master degree	0 (0%)
No, I do not have any of those	19 (95%)
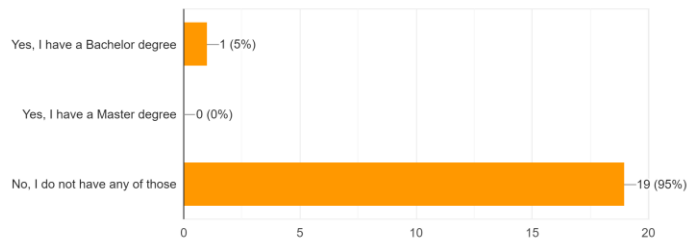
How can you describe your previous experience with e-learning?
20 responses

- Little experience
- Average experience
- Considerable experience

65%

10%

25%
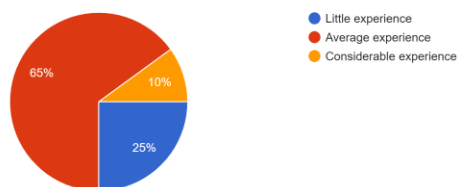
Have you been using e-learning technology during your studies?

20 responses

- ● Yes
- ● No
- ● If yes, which

90%

10%
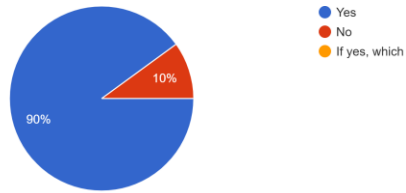
Learning experience of the case scenario

Have you dealt with similar case studies before?

20 responses

- ● Yes
- ● No

90%

10%
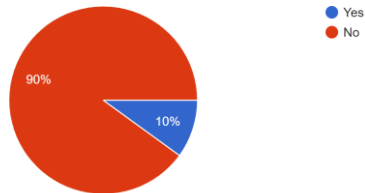
I felt I got enough information through this e-learning lecture

20 responses
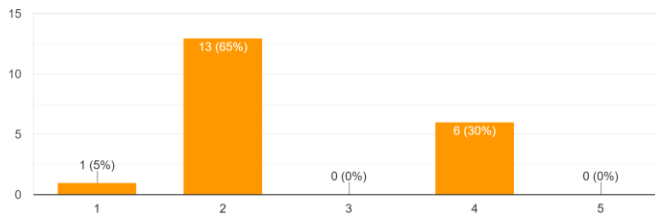
1 Agree
5 Disagreed

Did you find this e - learning solution more effective in undertaking this case scenario?

20 responses

- ● Yes
- ● No
- ● Maybe

15%

25%

60%
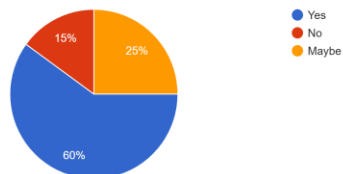
Do you think you got better outcomes by using this e-learning solution compared to your usual method of studying?

19 responses
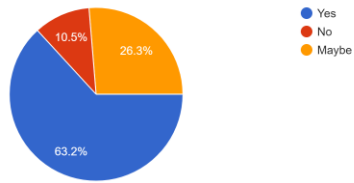
- Yes
- No
- Maybe

10.5%
26.3%
63.2%

I find this e - learning solution more effective in undertaking this case scenario
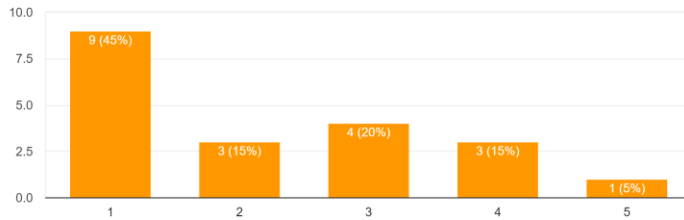
20 responses

1 Agree
5 Disagreed
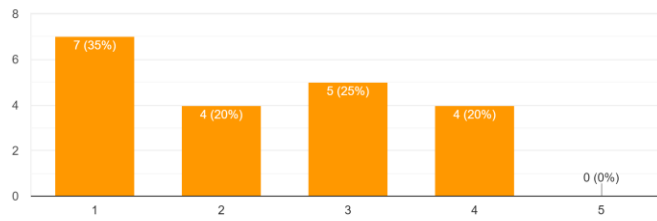
I feel I mastered the case- scenario

It was easy to stay concentrated throughout the case scenario in my learning process
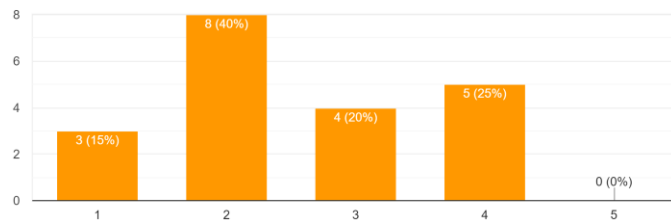
20 responses

1 Agree
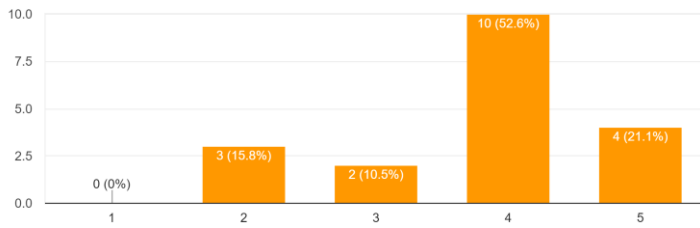5 Disagreed

I feel I mastered the case- scenario

20 responses

1 Agree
5 Disagreed

Did the tasks in the e-learning solution made it easier for you to reach a more decisive outcome?
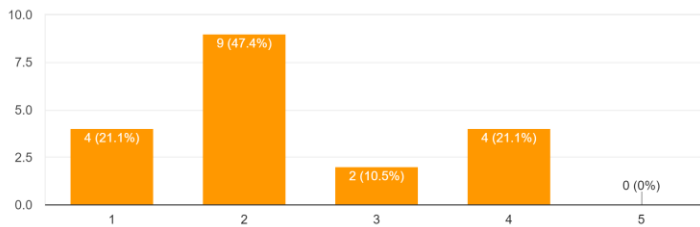
19 responses

1 Low Probable
5 Very likely

Did the usage of the e-learning solution provide clear benefits to understand the main case better?
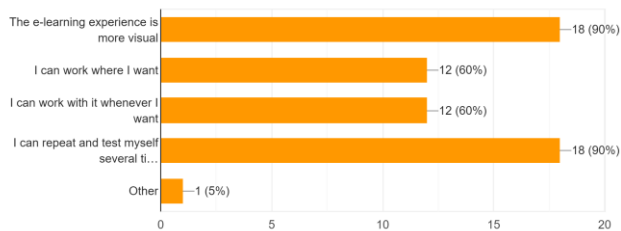
19 responses

1 Agree
5 Disagreed
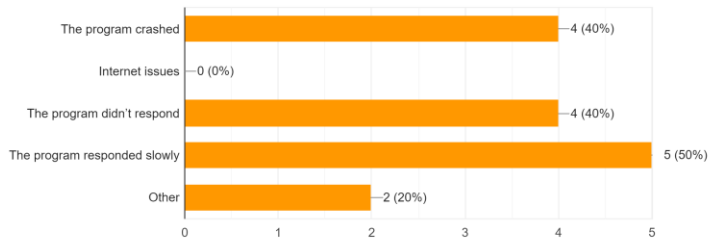
Experience of the e-learning solution

What factors do you see as benefits of using the e-learning solution?
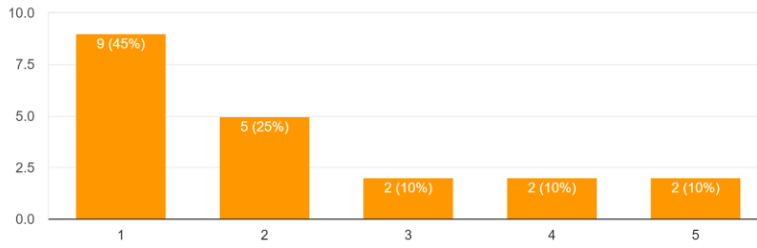
20 responses

Have you encountered any of the following technology-related challenges during the testing?

10 responses

Challenge	Count
The program crashed	4 (40%)
Internet issues	0 (0%)
The program didn't respond	4 (40%)
The program responded slowly	5 (50%)
Other	2 (20%)

I enjoyed using e learning technology during the learning process

20 responses

Rating	Count
1	9 (45%)
2	5 (25%)
3	2 (10%)
4	2 (10%)
5	2 (10%)

1 Agree
5 Disagreed

How easy was it to navigate the e-learning solution?

20 responses

Rating	Count
1	0 (0%)
2	1 (5%)
3	2 (10%)
4	5 (25%)
5	12 (60%)
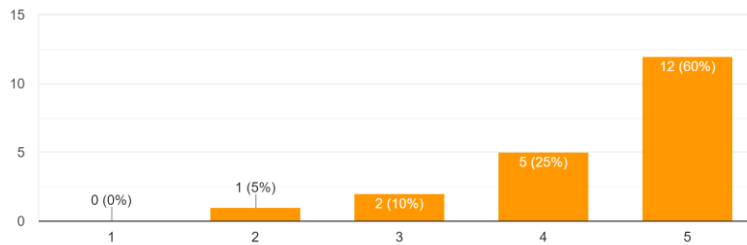
1 Difficult
5 Easy

What did you find difficult with the use of the e-learning solution?
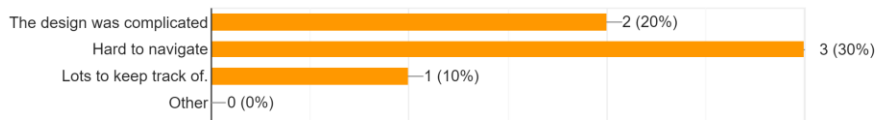
10 responses

Category	Count
The design was complicated	2 (20%)
Hard to navigate	3 (30%)
Lots to keep track of.	1 (10%)
Other	0 (0%)

What made it easy to use the e-learning solution?

20 responses

Category	Count
Well designed	11 (55%)
Easy to navigate	13 (65%)
Not too much information at once	17 (85%)
Not distracting	12 (60%)
Smooth learning experience	14 (70%)

I feel that this e-learning solution is:

19 responses

Category	Count
More beneficial than traditional learni…	12 (63.2%)
More motivating than traditional learni…	10 (52.6%)
Equal to traditional learning method.	2 (10.5%)
An improvement over learning method us…	5 (26.3%)
Other	1 (5.3%)
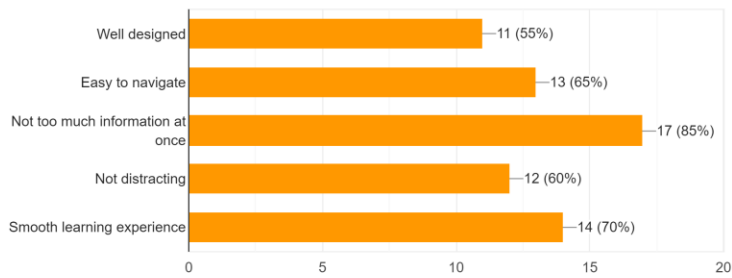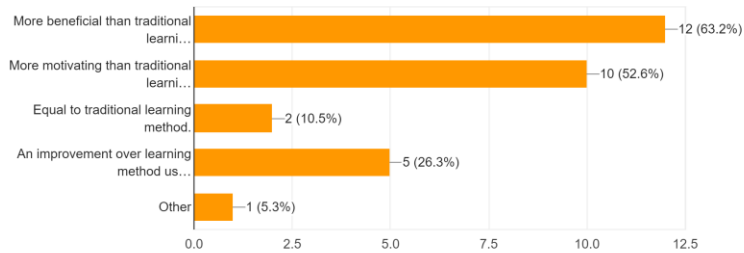
I had a positive experience using the e-learning solution
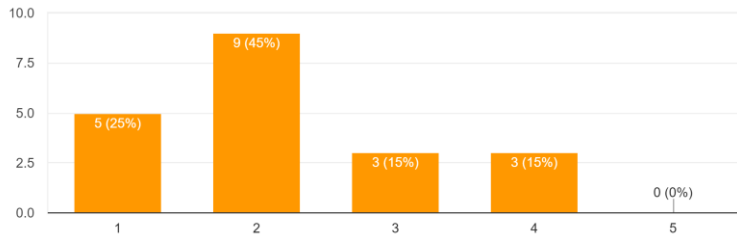20 responses
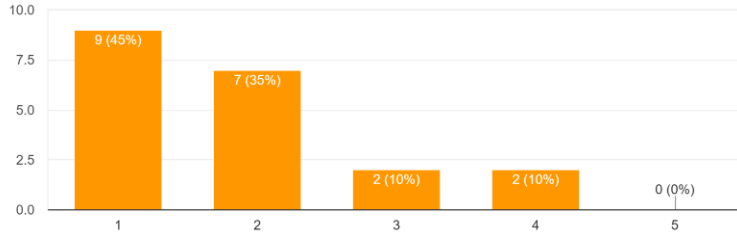
1 Yes, very
5 No, not at all

What is the probability that you would use this e-learning solution again
20 responses

1 Very likely
5 Never again
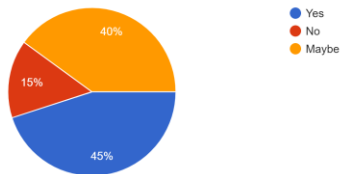
Would you rather use this e-learning method over your usual learning method if you had the choice?
20 responses

Yes
No
Maybe

45%
15%
40%

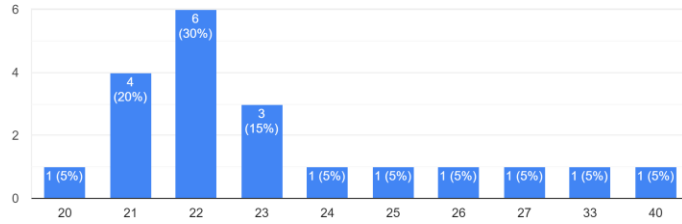# Appendix F

Survey Summary (Control group)

Background information

Age
20 responses

Gender
20 responses

- Female
- Male

55%

45%
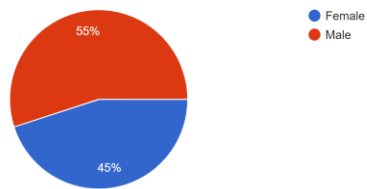
Do you have any other higher education?
20 responses
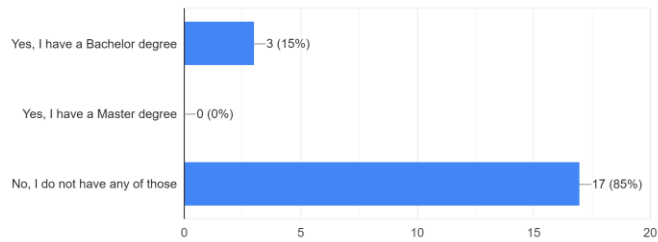
Experience of learning from the book

Do you feel this learning process are motivating?
20 responses
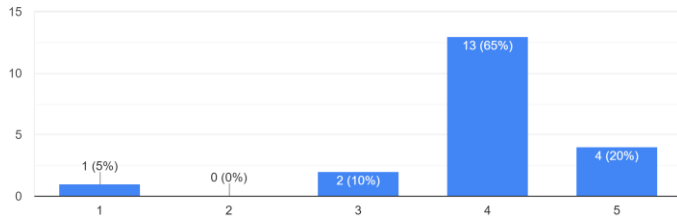
1 Not at all
5 Yes, very

Have you dealt with similar case studies before?
20 responses
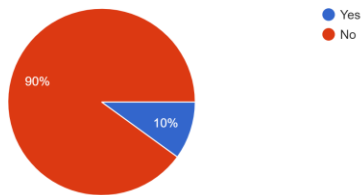
● Yes
● No

I felt I got enough information through this learning process
20 responses
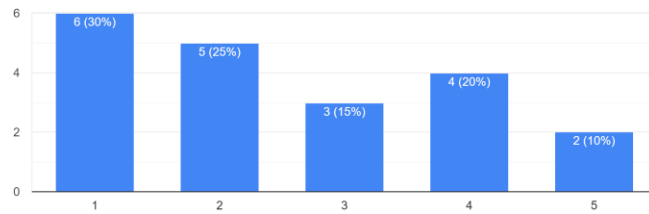
1 Agree
 5 Disagreed

Did you find this learning solution effective for understanding the required materiel in the book?
20 responses
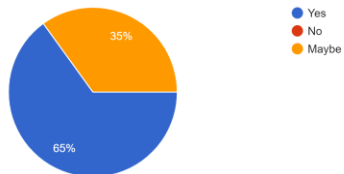
● Yes
● No
● Maybe

It was easy to stay concentrated throughout the case-task in my learning process
20 responses
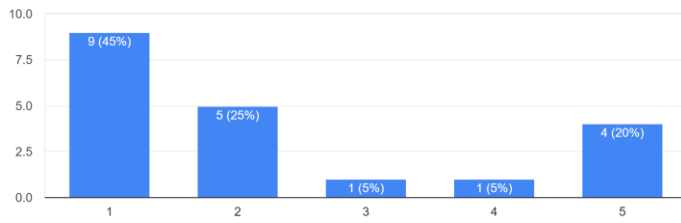
1 Agree
5 Disagreed

I feel I mastered the case-task
20 responses
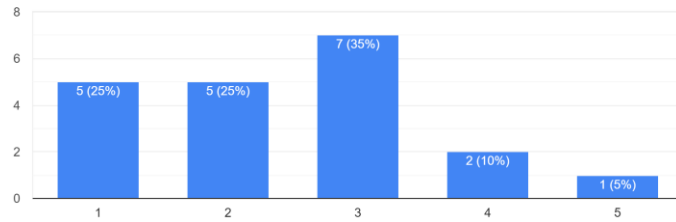
1 Agree
5 Disagreed

I feel the way we undertake case-task learning is very effective?
20 responses
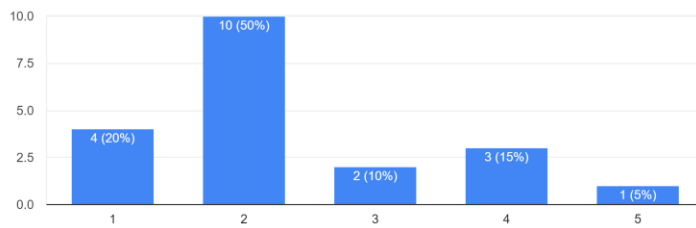
1 Agree
5 Disagreed

This learning process helps me to understand and successfully find optimal solutions to the case-task.

20 responses
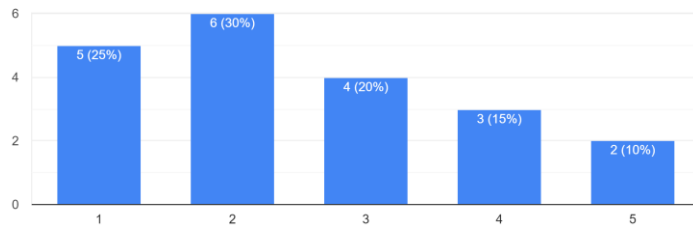
1 Agree
5 Disagreed

Experience of this learning solution

How could you improve your learning process?

18 responses
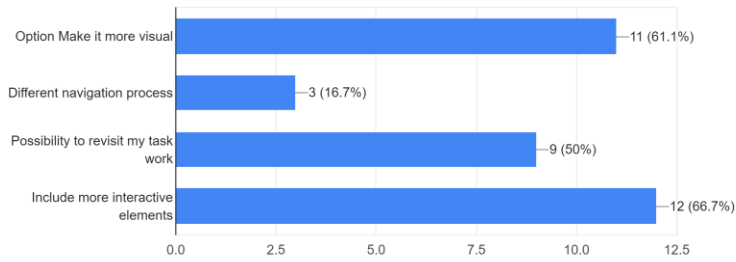
How easy was it to navigate this solution

20 responses
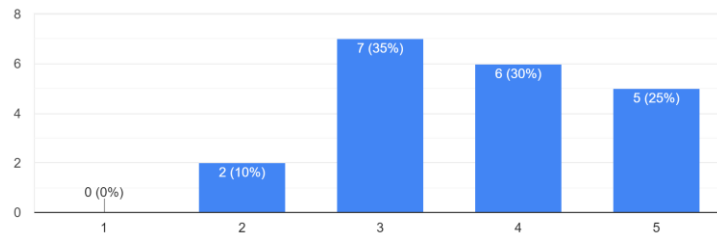
1 Difficult
5 Easy

I can see benefits for me by using the this solution to understand a case-task better

20 responses

1 Low Probable
5 Very Likely
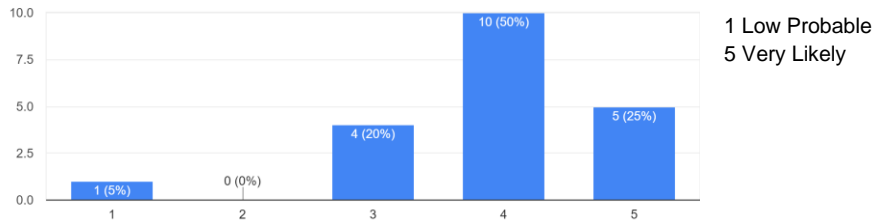
What did you find difficult with the use of this solution?

9 responses

The design was complicated — 1 (11.1%)
Hard to navigate — 0 (0%)
Lots to keep track of — 7 (77.8%)
Dificult to read — 0 (0%)
Difficult to understand — 0 (0%)
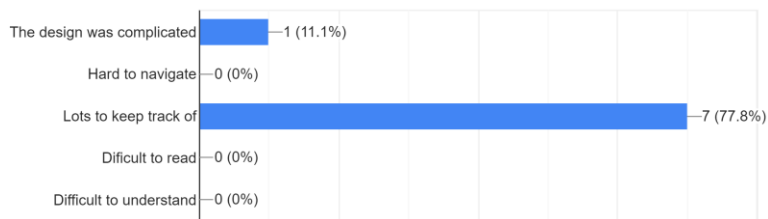
What made it easy to use this learning solution?

17 responses

Well designed — 8 (47.1%)
Easy to navigate — 7 (41.2%)
Not too much information at once — 6 (35.3%)
Easy to read — 13 (76.5%)
Not distracting — 9 (52.9%)
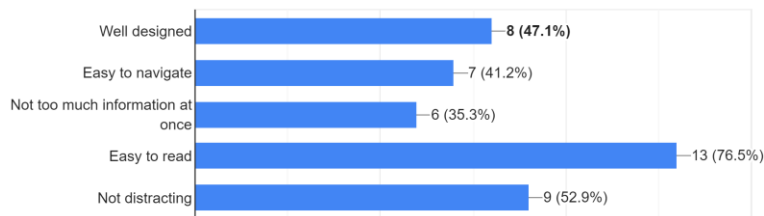
I feel I received enough information through this solution

20 responses

1 Agree
5 Disagree

Are you satisfied with this learning process?

20 responses

1 Yes, very
5 No, not at all

Bar chart values:
- 1: 4 (20%)
- 2: 10 (50%)
- 3: 4 (20%)
- 4: 2 (10%)
- 5: 0 (0%)
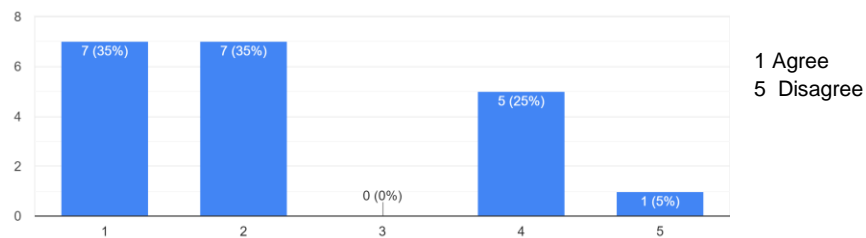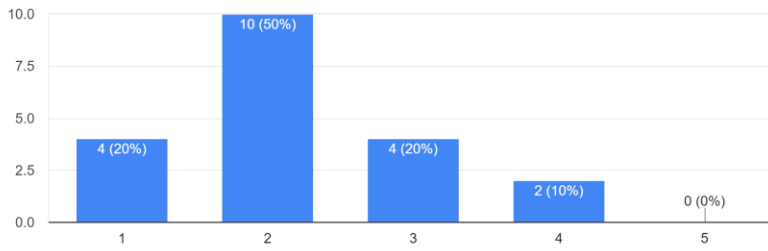
Do you think an e-learning solution would enhance your effectiveness when you are working with such case-task ?

19 responses
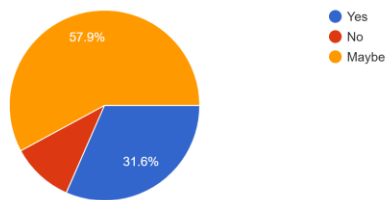
- Yes — 31.6%
- No
- Maybe — 57.9%

Do you think you would have had a better learning outcome if you were offered more flexibility on where and h...yes what would make it more flexible

19 responses

- Yes — 26.3%
- No — 15.8%
- Maybe — 47.4%
- If yes, left your comment here — 10.5%
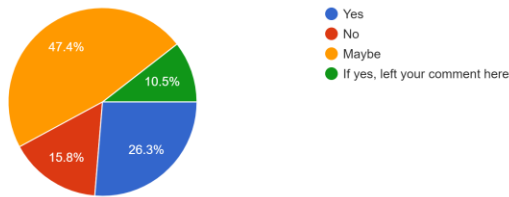
Would you like access to other teaching sources than the book ?

20 responses

- Yes — 80%
- No — 15%
- Maybe
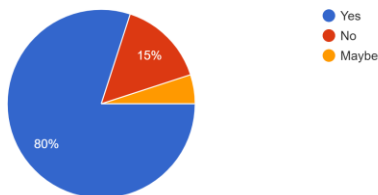
What different types of teaching sources would you like to included?

17 responses

Source	Responses
The web	10 (58.8%)
Articles	7 (41.2%)
YouTube	13 (76.5%)
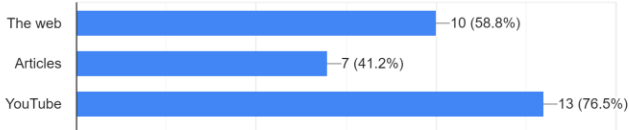
Appendix G
Additional commentary on the survey

Questionnaire survey Experiment group

Question 5: Have you been using e-learning technology during your studies?

If yes, which:

Participant 122 Canvas, digital video, youtube

Participant 123 exphil (flexphil)

Participant 124 Interaktive videoer,Nettforelesningen, Quiz

Participant 129 Canvas

Participant 130 Husker ikke hva der var brukk i noen fag i Bachelor i biologi ved NTNU

Question 19: What did you find difficult with the use of the e-learning solution?

Participant 121 Other: Bruk av mobiltelefon

Participant 123 Other: When i tried to go back the program froze. Had to redo it all

Participant 124 Other:Could not go back to previous question

Participant 129 Other: I did not

Participant 130 Other: Husker ikke alle på om hva man skulle gjøre på ..

Participant 136 Other: Litt tregt il tider

Questionnaire survey Control group

Question 15: What did you find difficult with the use of this solution?

Participant 115 Misforstå oppgaven, så belyste med 5HN og ikke noe konkret.

Question 16: What made it easy to use this learning solution?

Participant 113 Information beforehand

Question 20: Do you think you would have had a better learning outcome if you were offered more flexibility on where and how to learn this?If your answer is yes what would make it more flexible

Participant 112 Praktisk

Participant 113 More interactive/ visual

Participant 145 Example of different cases

Question 22: What different types of teaching sources would you like to included?

Participant 112 Eksterne foredrag fra reelt perspektiv

Participant 117 Hadde vært fint med flere eksempler på løsninger av lignende saker

Participant 145 Podcasts etc

Appendix H

The curriculum for B1 and B3

Undervisningsplan REL B1 2018 – 2019

Høst 2018

uke	Tema	Pensum	Rom		a
34	Presentasjon av faget	Politirapport 4. utgave: Bjerknes & Williksen s. 10 – 43 Etterforskning kapittel 1 (15-27 og 38-52)	klasserom	alle	3 2
34	Innføring i rettigheter og plikter	Politirapport: s. 168-190 og s 298-301	klasserom	alle	2
35	Retningslinjer for rapportskriving	Politirapport: s. 44-73	klasserom	alle	2
36	Avgitt anmeldelse (teori)	Politirapport: s. 74-101	klasserom	alle	2
37	Avgitt anmeldelse (case) - ARBEIDSKRAV 1	Politirapport: s. 74-101	Auditoriet	alle	1
37	Avgitt anmeldelse/BL	Politirapport: s. 74-101	datarom	alle	2
38	Avhørsprosessen (teori)	Etterforskning s. 28-38	klasserom	alle	2
38	Juss og etikk	Deler av Etterforskning kapittel 1 Spesifisering kommer senere	klasserom		2
39	Vitner (teori)	Politirapport: s 264-276 Etterforskning s. 28-38, 229-231	Storklasse-rom	alle	2
39	Vitner (diktat til lydopptak)	Politirapport: s 264-276	Storklasse-rom – en kl	alle	3
41	Politiarbeid på stedet (teori)	Politirapport s. 359 - 360 og Prosedyre for avhør på stedet Etterforskning kapittel. 12 (379-396)	Storklasse-rom	alle	3
41	Politiarbeid på stedet (case)	Politirapport s. 359 - 360 og Prosedyre for avhør på stedet Etterforskning kapittel. 12 (379-396)	Storklasse-rom - en kl	alle	3
42	Politiarbeid på stedet (case - baren)	Politirapport s. 359 - 360 og Prosedyre for avhør på stedet Etterforskning kapittel. 12 (379-396)	Baren i øvingsgata	alle	2 1
42	Protokollering av avgitt anmeldelse / diktat til lydopptak	Politirapport s. 359 - 360 og Prosedyre for avhør på stedet	Datarom	alle	2
43	Evaluering av dokumenter og målet med etterforskningen	Politirapport: s. 18 og s. 25-28	Klasserom	alle	2
44	Mottatt anmeldelse (teori)	Politirapport s. 168-189, 202-216 225-237 og 244-247	klasserom	alle	2
45	Mottatt anmeldelse (teori - oppgave utdeles)	Politirapport s. 168-189, 202-216 225-237 og 244-247	klasserom	alle	2
46	Mottatt anmeldelse (praktisk) - ARBEIDSKRAV 2	Politirapport s. 168-189, 202-216 225-237 og 244-247	Storklasse-rom	alle	2
46	Mottatt anmeldelse (praktisk) - ARBEIDSKRAV 2	Politirapport s. 168-189, 202-216 225-237 og 244-247	Storklasse-rom	alle	2

JUL

2	Tvangsmidler og egenrapporter (teori)	Politirapport: s. 102-116 Etterforskning kapittel 5 (152-188)	Klasserom	alle	2
3	Tvangsmidler og egenrapporter (case)	Politirapport: s. 102-116 Etterforskning kapittel 5 (152-188)	Leilighet i Øvingsgata / to timer datarom	Alle	4 2
3	Mistenkt/siktet (teori)	Politirapport: s. 282-291, 295-338, 341-343 og 347-360	Klasserom	alle	2
4	Mistenkt/siktet (praktisk)	Politirapport: s. 282-291, 295-338, 341-343 og 347-360	Klasserom 147 og 156	to basis-grupper	2
5	Mistenkt/siktet (praktisk)	Politirapport: s. 282-291, 295-338, 341-343 og 347-360	Klasserom 147 og 156	alle	2
6	Mistenkt/siktet - evaluering av avhør	Politirapport: s. 282-291, 295-338, 341-343 og 347-360	Datarom	alle	2
7	Kombinert anmeldelse (teori og praksis)	Politirapport: s. 86-87 og Kriminalteknikk kapittel 11	Datarom	alle	2 1
9	Øvelse vinning - praktisk oppgave		Øvingsgata	Basis-grupper	4
9	Øvelse vinning - dokumentasjon		Datarom	Basis-grupper	1
10	Øvelse vinning – praktisk oppgave de som ikke gjennomførte i uke 9		Øvingsgata	Basis-grupper	4
10	Øvelse vinning - dokumentasjon - de som ikke gjennomførte i uke 9		Datarom	Basis-grupper	1
11	Øvelse vinning - innlevering av gruppas sak		Datarom	alle	1
11	Avhørstaktikk	Politirapport: s. 282-291, 295-338, 341-343 og 347-360	Auditoriet		2
12	Øvelse vinning - avhør av siktede	Undersøkende avhørsmetoder i straffesaker & pensum mistenkt/siktet	Klasserom 147 og 156	alle	4
12	Øvelse vinning - avhør av siktede	Undersøkende avhørsmetoder i straffesaker & pensum mistenkt/siktet	Datarom	alle	2
13	Øvelse vinning - avhør av siktede - de som ikke gjennomførte uke 12	Undersøkende avhørsmetoder i straffesaker & pensum mistenkt/siktet	Klasserom 147 og 156	alle	4
13	Øvelse vinning - avhør av siktede de som ikke gjennomførte uke 12	Undersøkende avhørsmetoder i straffesaker & pensum mistenkt/siktet	Datarom	alle	2
14	Tilbakemeldingsmøte - øvelse vinning – samarbeid med ordensjuss		Storklasse-rom – en kl		4 2
16	**PÅSKE**				
17	Rettssak (jus)		Auditoriet	alle	2
18	Repetisjon		Auditoriet	alle	2
14. mai	Eksamen				5

Uke	Tema	Sted og tid	Merknader	Pensum
48	**Introduksjonsdag etterforsking?**	5? t Auditoriet	(Alle fagene)	Alle fagene – dette har vi snakket litt om på møtet, skal vi lage denne dagen? Hva er i så fall hensikten vår med den?
48-50	**TEMADAG MED ASBJØRN RACHLEW OG IVAR FAHSING: Kunnskapsbasert etterforskingsmetodikk og forebygging av justisfeil** ✓ Går av psyk sine timer, er helt sentral for REL i de videre leksjonene	6 t Audi Asbjørn Rachlew og Ivar Fahsing	Begge kommer til Stavern	Pensum i psyk + Bjerknes /Fahsing: Etterforskning – prinsipper og metoder i praksis: kap. 3
	Hypotesetenking ✓ Teorigjennomgang, gruppeoppgaver og felles gjennomgang	2 t klasserom	Nettleksjon som studentene skal ha sett i forkant. Kort teoridel (15-20 MIN), tre ulike caser, jobber i smågrupper, gjennomgang i plenum (ca 30 min)	Bjerknes /Fahsing: Etterforskning – prinsipper og metoder i praksis: kap. 3
	Målstyring – etterforskingsplan ✓ Teorigjennomgang, gruppeoppgaver og felles gjennomgang	2 t klasserom	Nettleksjon som studentene skal ha sett i forkant.Kort teoridel, jobber videre med casene fra siste time, jobber i smågrupper, gjennomgang i plenum	Bjerknes /Fahsing: Etterforskning – prinsipper og metoder i praksis: kap. 3
	JULEFERIE			
1-3	*Operativ etterforsking – operativ kriminalanalyse – del 1*	2 t klasserom	Teorigj.gang, og jobbing med case (ran av minibank)	Bjerknes/ Fahsing: Etterforskning –

			i smågrupper	prinsipper og metoder i praksis: kap. 4
	Operativ etterforsking – operativ kriminalanalyse – del 2	2 t klasserom	Teorigjennomgang, og jobbing med case i smågrupper	Bjerknes/ Fahsing: Etterforskning – prinsipper og metoder i praksis: kap. 4
4-5	**Avhør av fornærmede (video) – gjennomgang og evaluering i basisgrupper (Før timer studentene får i oppgave å se gjennom avhøret, evaluere avhøret etter visse kriterier samt identifisere bevistemaene i avhøret og vurdere disse)**	2 timer per klasse	Felles gjennomgang jobben studentene har forkant.	Klassene skal jobbe i grupper. Alle tre lærerne settes opp. Må ha tre (gruppe)rom
	Evaluering av avhørsrapport – i basisgrupper (Studentene får med «dårlig avhørsrapport» basert på avhøret av fornærmede, på slutten av forrige time. De skal evaluere denne ved hjelp av «sensorskjema», og kunne evaluere og begrunne evalueringen sin når vi kommer sammen i denne timen)	1 time per klasse	Felles gjennomgang av jobben studentene har gjort i forkant	Samme som over Klassene skal jobbe i grupper. Alle tre lærerne settes opp. Må har tre (gruppe)rom
6-12	*Avhørstaktikk* ✓ *Teorigjennomgang, gruppeoppgaver og felles gjennomgang*	2 t klasserom	Forutsetning: avhør av forn. fra casen mish. i nære har utdelt noen dok. - skal identifisere potensielle bevis og info de har i saken, og lage disposisjon til videre avhør (med konfrontasjon) av siktede	
	Avhørsøvelse ✓ Avhør av siktede – i basisgrupper (Etter øvelsen: hver på gruppa skriver sitt avhør, gruppa kommer sammen, evaluerer hverandres avhør etter visse kriterier, plukker ut ett avhør som skal representere gruppa, leverer inn alle sju avhørene med et notat hvor gruppa	5 t i grupperom i basisgrupper – ikke sett opp mer enn en gjennomkjøring	Gjennomfører avhør med konfrontasjon av siktede. Veiledning/evaluering av seg selv, hverandre og lærer underveis.	En klasse av gangen. Alle tre lærerne settes opp. I Fremo – vi må ha 6 grupperom. Nr 1-6.

			per dag pga slitasje på lærerne	Skrive fri forklaring+ lage avhør	
14 -	**Vitnekonfrontasjoner** ✓ Bruk av KO:DE og SIGne		2 t klasserom	Gruppene får utdelt oppgave på forhånd: skal forberede konfrontasjon med et vitne fra minibanksaken(minus lage selve fotokonfrontasjonen)Lage denne i timen etter plenumgjennomgang, og en eller flere grupper blir plukket ut til å gjennomføre en fotokonfrontasjon foran klassen	
	Rekonstruksjon		2 t storklasserom		Gjennomføres av Kripos v/Line og Elin
	Tverrfaglig etterforskingsøvelse		3+3 timer	Faglærere fra alle fagene i ETF skal være til stede	En klasse møter om gangen. De to 3-timers øktene skal legges med gjerne et par dager mellom
22	**Siste forberedelse** ✓ Spørsmålsavklaring før eksamen		1 t Auditoriet	Alle faglærere	
23-24	**Eksamensuker**				

Appendix I

Pages from the theory book

Etterforskningsprosessen – en kontinuerlig innsamling og vurdering av spor og informasjon

I enhver sak må vi altså klargjøre hva som har foregått, hva det er mistanke om og om mistanken er sterk nok til å iverksette etterforskning. Deretter kan de alternative hypotesene identifiseres. Altså dersom det ikke er det vi mistenker, hva kan det da være? Hensikten er *ikke* å finne frem til bare én hypotese og forfølge den, men å undersøke bredt gjennom å lage alle *konkurrerende hypoteser*. Med konkurrerende hypoteser mener vi at hovedhypotesene som stilles opp i saken, skal være gjensidig utelukkende. Dersom den ene er sann, kan ikke den andre være det. Den mest solide måten å undersøke noe på er å forsøke å utelukke eller motbevise alle de relevante hypoteser. Den hypotesen som best motstår våre forsøk på utelukkelse, vil normalt være den sterkeste[20]. Ved en slik bred tilnærming vil vi lettere unngå å låse oss i én teori, men heller holde alle muligheter åpne frem til det er innhentet tilstrekkelig med informasjon som styrker én hypotese og svekker de andre konkurrerende hypotesene. Spørsmålet ved tiltale er om en slik hypotese er sannsynliggjort utenfor all rimelig tvil og om dette kan bevises rettslig.

Det skjer naturligvis ofte at etterforskningen ikke klarer å utelukke de konkurrerende hypotesene, og saken vil dermed stå igjen med mer enn bare én sterk hypotese. Saken blir da normalt henlagt etter bevisets stilling. I tilfeller hvor etterforskningen står igjen med hypotesen som tilsier at det ikke har foregått noen straffbar handling eller hvor mistenkte viser seg å ha vanntett alibi, så vil saken henlegges som intet straffbart forhold. I motsatt fall, når saken viser en tilstrekkelig grad av utelukkelse av de hypoteser som konkurrerer med skyldhypotesen, vil saken ende med siktelse og tiltale. I domstolen vil politiets vurderinger bli prøvd på nytt. Domstolen skal med involvering fra partene forsikre seg om at etterforskningen har stilt alle de riktige hypotesene og at de er etterprøvd på en reglementert, forsvarlig og pålitelig måte. Norsk rett bygger på fri bevisførsel. Det vil si at det er opp til retten å vurdere om bevis skal tillates ført og hvilken verdi de mener bevisene skal tillegges. Under hovedforhandlingen skal retten avgjøre om påtalemyndighetens tiltaleposter er sterke nok til at alle andre realistiske hypoteser er utelukket utenfor enhver rimelig tvil.

Den tiltalte skal ikke bevise sin uskyld, men påtalemyndigheten skal ved sin bevisførsel overbevise domstolen om at deres gjerningsbeskrivelse er den eneste riktige. I den strafferettslige behandlingen skal den mistenkte kunne forholde seg passivt og anses som uskyldig frem til det motsatte er bevist ved dom.

---

20   Se Popper, K.R. (1963)

Dette er det som kalles *uskyldspresumpsjonen* og som omhandles både i FNs menneskerettserklæring, Den europeiske menneskerettskonvensjon (EMK) og i Grunnloven. De konkurrerende hypotesene og etterforskningsplanen vi lager, skal hjelpe oss å opprettholde disse prinsippene. Samlet skal metodikken, loven og systemet sørge for en mest mulig effektiv, trygg og forsvarlig etterforskning. I tillegg skal etterforskningen utføres så raskt og så skånsomt som mulig. Innsyn og notoritet gir mulighet for løpende kontroll og evaluering. *Notoritet* vil si at de opplysninger, gjenstander, dokumenter, spor eller forklaringer som innhentes i saken, dokumenteres og gjøres tilgjengelig for etterforskningsledelsen, etterforskerne, forsvarer og eventuell bistandsadvokat. For å styre en etterforskning og for å ha notoritet er det nødvendig med en skriftlig plan, en *etterforskningsplan*. I de mest alvorlige eller i kompliserte saker er en etterforskningsplan pålagt, men det er helt nødvendig at det foreligger en plan for alle saker. En etterforskningsplan skal inneholde en beskrivelse av alle relevante og konkurrerende hypoteser, hvilke straffebud som synes aktuelle å etterforske opp mot, hvilke bevistemaer, det vil si hvilke vilkår for straff loven beskriver, etterforskningen må søke å belyse, hvilke etterforskningskritt som bør gjøres av hvem til hvilken tid, og når og på hvilket grunnlag beslutninger fattes. Skal etterforskningskritt utføres, kreves det planlegging først. I planleggingen inngår det vurderinger av egen kompetanse, behov for andres bistand, behov for utstyr og en begrunnet plan på hvordan innsamlingsmetoden skal foregå. Utføringen må være systematisk, profesjonell og kunnskapsbasert.

I lys av det som er beskrevet i dette kapitlet, vil du sikkert nå kunne produsere en rekke alternative hypoteser i scenariet med mannen som ble funnet på gata med hodeskader og som sa at lommeboka var borte. Opplysninger om at det luktet alkohol av ham fikk du også. Prøv å finne frem til slike ulike hypoteser, skriv dem ned og tenk på hvordan disse vil føre til ulike vinklinger og informasjonsbehov i etterforskningen. Skriv ned hva slags informasjon du mener undersøkelsen trenger. Spør deg deretter hvilke ulike informasjonskilder slik som vitner, tekniske og digitale spor som kan besvare spørsmålene, og om saken er av en slik art at straffeprosessloven tillater at vi innhenter denne informasjonen. Dette er det vi mener med en *metodisk mål- og regelstyrt etterforskning*. En slik tilnærming vil kunne hjelpe deg til å utføre bredere og mer kritisk etterforskning enn dersom du kun tenker at mannen sikkert var slått ned og franet lommeboken sin.

Selve etterforskningsprosessen består av fasene innsamling, kontrollere, koble, konstruere, vurdere og konsultere – og skal gi svar på hva, hvor, når, hvordan,

hvem og hvorfor (6HN) handlingen er begått.[21] Modellen for etterforsknings-prosessen er lagd som en sirkel for å illustrere at de ulike tiltakene, handlingene eller spørsmålene som regel må gjentas. Dette gjelder for den helhetlige etter-forskningen, men også for utføringen av de enkelte etterforskningsskrittene.

Uavhengig av hvor man er i etterforskningen vil det hele tiden dreie seg om å identifisere hva som er relevant å innhente informasjon om. I identifi-seringsdelen er det nødvendig med grunnleggende forståelse av hva som kan være straffbare forhold. Med denne juridiske innsikten vil man kunne peke ut ulike informasjonsbehov, eller det som omtales som bevistema. Rettsrelevant informasjon og spor må forsøkes å innhentes ved bruk av forskjellige etterfors-kningsmetoder. Materialet som innhentes må iblant analyseres og systemati-seres, tolkes og forstås. Hva vet vi? Hva vet vi ikke? I denne prosessen er det viktig å se for seg de ulike hypotesene informasjonen kan bidra til å belyse. På den bakgrunn må etterforskerne identifisere behovet for ytterligere informa-sjonsinnhenting som mest mulig effektivt vil kunne teste og skille mellom de konkurrerende hypotesene i saken. Dette gjøres best gjennom kryss-sjekking av informasjon og systematiske forsøk på utelukkelse av skyld gjennom testing av alle alternative forklaringer. Se Fahsing (2016).

All etterforskning må *dokumenteres* på en slik måte at andre forstår og kan etterprøve vurderingene. Derfor må materialet beholdes mest mulig originalt, og fremgangsmåter som er benyttet må beskrives. Etterforskeren bør også lage en oversikt over resultatet av de enkelte etterforskningsskrittene. På den måten kan etterforskerne ta stilling til om de enkelte hypotesene er styrket, svekket eller ingen av delene. Dette vil ganske enkelt gjøres ved å lage en oversikt i form av en hypotesedrevet kryss-sjekkingsmatrise for eksempel med fargekoder som viser om opplysningene er konsistent (styrker) eller inkonsistent (svekker) med hypotesen eller om den er nøytral. Se eksempel i figuren under, hvor vi har tatt utgangspunkt i scenariet med vår mann som har hodeskader og sier han er blitt fratatt lommebok (se side 15).
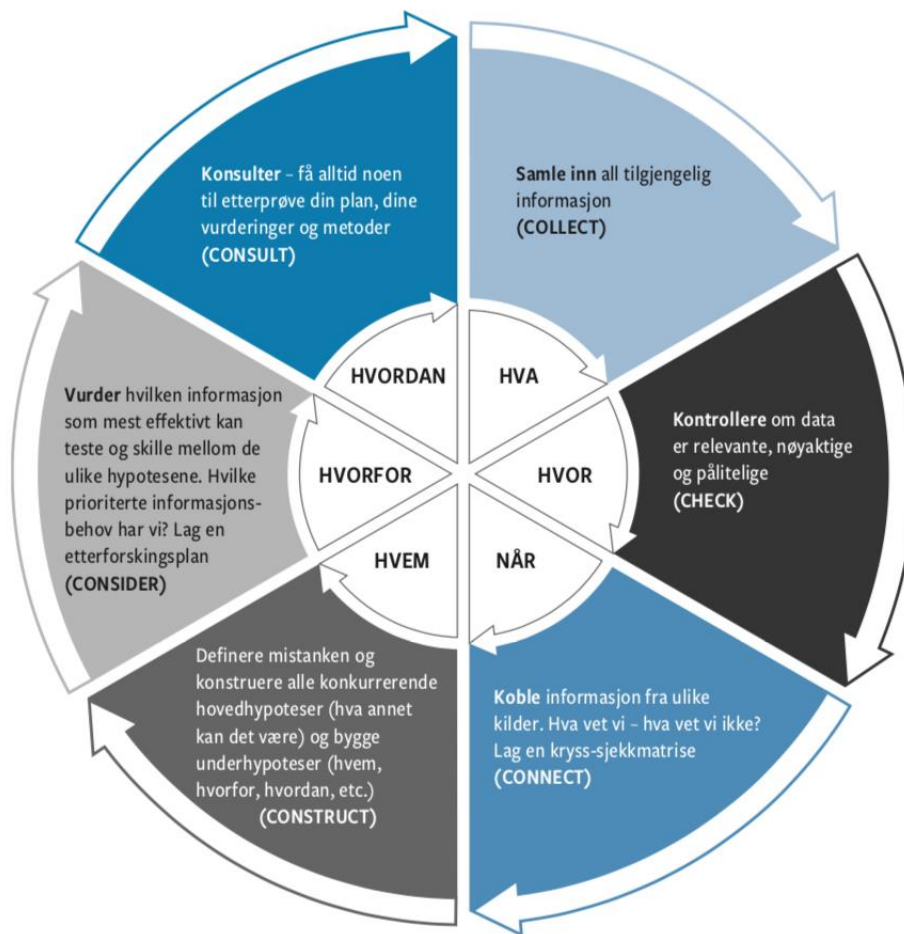
Figur 1.8   Etterforskningssirkelen[22] med de seks undersøkende
spørsmål i sentrum og de seks gjentagende fasene rundt.

	Ran eller grovt ran	Tyveri eller grovt tyveri	Kroppskren-kelse	Ulykke	Uriktig anklage
Åstedsrapport	Forenlig (Side 1–3)	Forenlig (Side 1–3)	Forenlig (Side 1–3)	Forenlig (Side 1–3)	Forenlig (Side 1–3)
Avhør av fornær-mede	Forenlig (Side 2–3)	Forenlig (Side 2–3)	Uforenlig (Side 2–3)	Uforenlig (Side 2–3)	Uforenlig (Side 2–3)
Avhør av vitne 1	Forenlig (Side 2)	Forenlig (Side 2)	Uforenlig (Side 2)	Uforenlig (Side 2)	Uforenlig (Side 2)
Avhør av vitne 2	Forenlig (Side 3)	Forenlig (Side 3)	Uforenlig (Side 3)	Uforenlig (Side 3)	Uforenlig (Side 3)
Overvåkningska-mera på åstedet	Forenlig Tid: 00:20–35	Nøytral Tid: 00.20–35	Uforenlig Tid: 00.20–35	Uforenlig Tid: 00.20–35	Uforenlig Tid: 00.20–35
Legeerklæring	Forenlig (Side 1)	Forenlig (Side 1)	Forenlig (Side 1)	Uforenlig (Side 1)	Uforenlig (Side 1)
Kontoopplysninger	Forenlig (Side 3)	Forenlig (Side 3)	Uforenlig (Side 3)	Uforenlig (Side 3)	Uforenlig (Side 3)
Rapport om innle-vert lommebok på hittegodskontoret	Forenlig (Side 1)	Forenlig (Side 1)	Uforenlig (Side 1)	Uforenlig (Side 1)	Uforenlig (Side 1)

Figur 1.9 Eksempel på hypotesedrevet kryss-sjekkingsmatrise som viser at mistanken om ran eller grovt ran er den sterkeste hypotesen slik saken står på dette tidspunktet. Blå celler er forenlige og styrker hypotesen, grå er uforenlige og svekker hypotesen, mens hvite er nøytrale eller sier ikke noe om hypotesen. Til vanlig anbefales å bruke farge-kodene grønn for styrker, gul for nøytral og rød for svekker.

Den enkelte etterforsker, etterforskningsleder og påtaleansvarlig har alle et an-svar for at etterforskningen søker å belyse alle aktuelle hypoteser for å forsøke å finne frem til den mest sannsynlige. Når all tilgjengelig informasjon er innhentet, må det foretas en helhetlig vurdering av bevisene. Er bevisene så sterke, enty-dige og tilgjengelige at de fremstiller handlingen utover enhver rimelig tvil, og det ikke foreligger straffefritaksgrunner, så kan påtalemyndigheten ta ut tiltale eller skrive ut et forelegg.

Appendix J

Main Case

Case

Bakgrunn: Mheili Al Sayed, 17 år, bor sammen med sin mor og far og en yngre bror (12 år). Hennes foreldre er kurdere som emigrerte fra Nord-Irak i 2013. Mheili går i 2. klasse på videregående skole. Hennes far jobber som lokomotivmekaniker i NSB og hennes mor er husmor. De lever i et rolig forstadsområde nær en stor park, en del restauranter, shoppingområder og en jernbanestasjon.

Søndag 21. oktober kl. 12:15 (forestill deg at dette var i går) ringte Raihed Mursha, (kvinne) 17 år som bor i by X, til politiet og meldte sin beste venninne Mheili Al Sayed, savnet. Hun forklarte at de to hadde avtale om å møtes i går kveld og at Mheili hadde planlagt å sover over hos Raihed. De snakket sammen på mobil like etter kl. 16:00 og de ble da enige om å møtes utenfor den lokale kinoen kl. 18:00. Mheili skulle spasere de 2 -3 km til kinoen fra sitt hjem. Raihed møtte opp utenfor kinoen ca. Kl. 1750, men Mheili dukker aldri opp. I stedet fikk hun følgende tekstmelding fra hennes mobiltelefon: "Hjelp - jeg blir.." (Ingenting mer). Raihed prøvde å ringe Mheili tilbake flere ganger uten å få svar. Hun ble svært bekymret og gikk derfor straks hjem til henne (Mheili). Hun ringt på dørene flere ganger men ingen åpnet. Raihed gikk deretter tilbake til sitt eget hjem samtidig ringte hun til flere av deres felles venner. Ingen hadde hørt fra Mheili. Neste morgen rundt kl. 09, gikk hun tilbake til Mheilis hjem. Mheilis mor åpnet da døren, men da hun så Raihed ropte hun bare: "Nei, nei, nei» på arabisk og lukket døren kraftig igjen. Raihed gikk deretter rett hjem igjen og diskuterte situasjonen med sine foreldre. Sammen ble de enige om å varsle politiet.

En politipatrulje kontaktet Raihed søndag ettermiddag ca. kl. 17:00. Raihed forklarte da at Mheili for et par måneder siden hadde blitt sammen med en gutt på skolen deres som heter Javed Smith. Da hennes lillebror så dem sammen fortalte han det straks til foreldrene. Etter dette ble Mheili innelåst hjemme i en hel uke. Mheili avsluttet dermed all kontakt med Javed.

Ca. Kl. 1730 kjørte politipatruljen videre til Mheili Al Sayeds hjem. Mheilis far, Mohammed Al Sayed åpnet døren. Han sa at de ikke hadde sett Mheili siden hun forlot hjemmet rundt kl. 1730 i går for å besøke en venninne. Hun skulle ha vært hjemme før 23:30 men hun hadde fortsatt ikke vist seg. De var derfor dypt bekymret for datteren, men hadde ingen teorier om hvor hun kunne være eller hva som kunne ha skjedd med henne. Patruljen spurte om de fikk komme inn i huset for å utføre et søk på Mheili værelse. Det tillot imidlertid ikke faren siden de hadde besøkende fra Kurdistan og at besøket bodde på samme rom som Mheili. I stedet spurte han om ikke politiet kunne komme tilbake neste dag. Da politipatruljen var i ferd med å forlate stedet fikk Raihed øye på en sko og en sokk som lå på den andre sine av veien - like ved parken. Hun sa at den rosa Nike joggeskoen var identisk med de skoene Mheili pleide å bruke. Funnplassen var rett over gaten, ca. 50 meter fra Mheili sitt hjem. Patruljen tok bilder, sikret åstedet og rekvirerte straks kriminalteknikere til stedet.

Samme kveld ca. kl. 1830 ble det utstedt en beslutning om ransaking i den savnede Mheilis hjem og tilstøtende områder, rom og lokaler. I en avfallsdunk på kjøkkenet til familien Al Syed ble det i det øvre laget av avfallet funnet og sikret en mobiltelefon. Denne var ødelagt og bøyd ut av form. I følge Raihed var den identisk med Mheilis telefon.

Patruljen besluttet på dette grunnlaget å arrestere Mheilis far, Mohammed Al Sayed, mistenkt for falsk forklaring og medvirkning til kidnapping eller voldsutøvelse mot sin egen datter.

Mandag morgen (dagen etter) utpekes du som leder for etterforskningen av Mheilis forsvinning.

Oppgave

Skriv opp alle hypoteser du mener kan være relevante å undersøke i denne saken. (Med hypoteser menes alle testbare teorier om **HVA** som kan ha hendt). Ikke skriv ned etterforskningsskritt her (hvordan du skal finne ut av ting) – det kan du gjøre senere.

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

———————————————————————————————

Tid til disp. ca 10-12 min. Ikke se på naboen, men når du er ferdig kan dere bytte oppgave for så å score hverandre. Nærmere instrukser om hvordan du skal gjøre dette vil bli gitt når du er ferdig med oppgaven.

Lykke til!!

Appendix K

Mini Case

Mini case

Ruth Ester Karlsen (72) ringer inn til politiet i Lilleby for å anmelde et sykkeltyveri. Hun fortalte at hun hadde vært på kafé hvor hun møtte to barnebarn Rolf Karlsen (16) og Frida Hennie (14). Da de var ferdig skulle hun hente den helt nye sykkelen sin, men den var borte. Hun har syklet i alle år og parkerer alltid sykkelen på samme sted. Dette er utenfor en klesbutikk kalt Lilleby klær. Butikken er drevet av en god venninne – Ellen Jonsrud. Ruth bor litt utenfor byen og uten sykkel vil hun bli veldig låst til hjemmet sitt. Hun har ingen andre transportmidler og hun er derfor skikkelig opprørt over hendelsen.

På spørsmålet om hun låste sykkelen sin svarer hun at hun selvfølgelig gjorde det, og at hun ikke er verken senil, dum eller naiv. På spørsmål om hun er sikker på at hun ikke har parkert den noe annet sted svarer hun at hun alltid parkerer og låser den fast på den samme plassen. Helt siden jeg begynte å sykle til byen for nesten 30 år siden.

En politipatrulje dro til stedet for å roe henne ned og se på saken. Der Ruth Ester sa sykkelen hadde stått parkert fant politiet svært lite bortsett fra en liten avrevet rød tøybit. Barnebarnet Rolf hadde forlat stedet da politiet kom, men Frida opplyste at bestemoren i det siste har begynt å bli ganske surrete. Hun rotet litt med hvilken dag det er, osv. Frida hadde selv ikke sett sykkelen, men bevitnet at bestemoren alltid pleier å sykle til byen. Rolf hadde gått for ca. en halv time siden, men mens de sto der kom Rolf gående på den andre siden av gata. Frida ropte på ham og da kom han bort til dem. Han virket litt nervøs og da den røde shortsen hans hadde en rift i stoffet over det venstre kneet. Han benektet å ha rørt sykkelen og sa at han shortsen hans hadde vært skadet i lengre tid. Rolf er tidligere anmeldt for besittelse av narkotika.

Hva tenker du kan ha skjedd med sykkelen? Tenk deg godt om og skriv ned dine forskjellige hypoteser.