UPPSALA
UNIVERSITET

Department of Informatics and Media

Master Programme in Social Sciences,
specialization in Digital Media and Society

Two-year Master's Thesis

Turn and face the strange:
the role of communication, encouragement and feedback during technological changes in an educational setting

Student: Bóas Hallgrímsson

Supervisor: Ylva Ekström

May 2018

Uppsala, Sweden 2018

Abstract

In 2008 a new educational initiative termed “School without segregation” was implemented in Iceland. Its goal was to ensure that all children would be provided with education suited to individual variations in social and educational needs. Coinciding with this policy initiative a new technology strategy was implemented in the municipality of Kópavogur, Iceland´s second largest city, with the aim to equip children to deal with the fundamental technological changes in modern society and integrate technology in their education. As an integral part of this strategy all students in Kópavogur, from the fifth to the tenth grade were given iPads in 2015. The affected population was approximately 4.700 students and over 450 teachers.

A significant body of research has examined how students fare when technology is integrated into their education. However, this thesis aims to examine how the implementation of this tablet-centric initiative affected the working environment of the municipality´s teachers, a subject that has been researched to a much lesser extent. With the aid of personal interviews communication between stakeholders of the initiative, strategies to motivate and encourage teachers in dealing with the change in their working environment and support afforded during the process was examined. Special focus was placed on the extent of involvement and participation of teachers during the implementation and the question of whether teachers´ opinions had an impact throughout the process. The thesis analysis is based on 18 semi-formal interviews with teachers from all of the city´s nine schools. Additionally, the team in charge of leading the implementation was interviewed to further broaden the scope.

In brief, the thesis highlights that contention surrounded various aspects of the implementation. Many of the teachers felt overwhelmed and hesitant and described feeling that their concerns went unnoticed. Today, however, three years down the road, the iPads seem to have become an integral part of the everyday working environment of teachers and students alike and none of the teachers want to go back to teaching without iPads.

Keywords: Tablets, Education, Technology, Informal Learning, Communication, Empowerment.

Acknowledgements

I would like to thank Ylva Ekström, my supervisor, for acting as an intellectual midwife during the process of writing this essay, for her support, patience and pressure. Support without pressure does not amount to much, as will be addressed on the following pages.

I would like to thank, from the bottom of my heart, my wife for being the most reliable and grounded person I know. Without her I would never have been able to pull this research off.

My children I would like to thank for not giving up on me. There have been times where I would not have blamed them for doing so. For their patience and for the moments when they have made me smile despite my inner anxiousness they deserve all my thanks.

My parents, in-laws and family I would also like to thank for their support and encouragements.

Finally, I would like to thank my co-students and the professors from the department. These have been great two years. I feel privileged.

Table of figures

1. Introduction

Arguably, information and communication technologies (ICTs) have led to an unprecedented, and oftentimes dramatic change in education. (Tapscott, 2009) Teaching material that was previously communicated through the pages of actual physical books or lecture slides is now projected onto whiteboards or sent out onto digital screens and traditional textbooks and blackboards are increasingly being changed out for digital devices, such as tablets. Homework is delivered and returned through email or dedicated portals and "flipped classroom" technology; where teachers record their lectures and send them to students prior to class is spreading like wildfire. Thereby students are able to engage in preliminary online learning, may revisit the teacher´s material at their own leisure and actual class time may be used for discussions and problem solving. (Carl Reidsema, 2017) While some consider the emphasis on technological advances in education to be greatly overemphasized, others consider the changes to be too slow and classrooms lagging behind the modern technological revolution: "A nineteenth century visitor would feel quite at home in a modern classroom, even at our most elite institutions of higher learning." (Ferster, 2014, p. 1)

Learning can be divided into formal or informal learning. (Peters, 2008) Laurence Peters defines formal education as: *"Information transmitted in lecture fashion by the teacher and found in textbooks and approved by the teacher in the form of assignments, grades and assessments*." (Peters, 2008, p. 104). On the other hand, informal learning has been defined as:

> "...any activity involving the pursuit of understanding, knowledge or skill which occurs without the presence of externally imposed curricular criteria. Informal learning may occur in any context outside the pre-established curricula of educative institutions. The basic terms of informal learning (e.g. objectives, content, means and processes of acquisition, duration, evaluation of outcomes, applications) are determined by the individuals and groups that choose to engage in it." (Livingstone, 2001, p. 4)

As technology plays an ever-increasing role in education, teachers may find themselves in a peculiar position: while the students, born in this digital age, are natives to the technology, teachers are often near-novices. Marc Prensky goes so far as claiming that modern-age students are no longer the people our education system was designed to teach. (Prensky, 2001) In 2001 Prensky coined the term *digital natives* to describe the generation born into the technological advantages of modern times. Prensky calls those born before this technological shift *digital immigrants* and claims that, for the most part, teachers, many of whom were born well prior to

the invention of smart devices, fall into the latter category. (Prensky, 2001) Nonetheless, *digital immigrants* are expected to guide the *digital natives*, many of whom have never known a world void of the Internet, social media or tablets.

The larger part of social dialogue about technology in classrooms is technologically optimistic, emphasizing positive facets of this paradigm shift in education, notably the skills, flexibility and opportunities it offers to students. (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015;Prensky, 2001; Tapscott, 2009) In 1997, then, Prime Minister of the UK, Tony Blair wrote the foreword for a government consultation paper called *Connecting the Learning Society,* in which he asserted:

> "Technology has revolutionized the way we work and is now set to transform education. Children cannot be effective in tomorrow´s world if they are trained in yesterday´s skills." (Blair, 1997, p. 1)

The changes that are considered to be essential and crucial to the educational system by some have also been the subject of criticism. The critique usually centers on students, noting, for example, that we know little about long term effects of technological immersion and its impact on concentration, creativity and attention span. (Kabali, et al., 2015) Interestingly, much less is known about the impact this focus on technology in the classroom has had on educators. This presents an important gap in the literature since teachers remain central and crucial to the pursuit of education, even as autonomous and self-guided learning and networked methods play a growing role. In this thesis I aim to fill a part of this knowledge gap, focusing on a case study in Iceland. The overriding aim of this study was to examine the impact of educational digitalization has had on educators with emphasis on routes of communication and the importance of support and feedback in fostering positive outcomes. Semi-formal interviews with 18 teachers in the municipality of Kópavogur were conducted in order to examine the impact of iPads being introduced as educational tools in their working environment. Additionally, a single interview with the team in charge of the implementation was conducted. Qualitative approaches were then used in coding the interviews and they were analyzed with the help of different frameworks and theory introduced in the methodology chapter, among which were the TPACK framework introduced by Mishra & Koehler, a framework for teachers´ integration of information and communication technologies into their classroom practice as introduced by Donnelly, McGrarr & O´Reilly. In addition, the role of teachers was considered, the role of education and the impact of educational changes. Finally,

participatory aspects, empowerment and authority among teachers were considered during an implementation of new technologies.

2. Background

In 2008 an educational policy termed “Skóli án aðgreiningar” (School without segregation) was implemented in Iceland. The official goal of the policy was to locally provide all children with education aimed to satisfy individual variations in educational needs and ensure that students had equal opportunities within the educational system, regardless of their social class, background, religion, native language or possible disabilities. (Lög um grunnskóla, 2008) Coinciding with these changes work was started on a new technology strategy in the town of Kópavogur (Iceland´s second largest municipality) to ensure that all students, regardless of class or economy status had the same access to technology (Kopavogur.is, 2018). In 2014, Kópavogur introduced a new policy on information technologies emphasizing the use of ICTs in education (Gunnlaugsson, Sigurbjörnsson, Gunnarsdottir, & Gislason, 2017). They policy goal was to recognize the larger changes in technologies in modern societies and better equip future citizens to deal with those changes. The educational committee of Kópavogur made the decision to supply all students from the fifth grade to the tenth grade with tablets, namely iPads. By the fall of 2015 all students and teachers had been supplied with tablets (Gunnlaugsson, Interview with the implementation team, 2018). The method chosen was the so called “one-to-one” method, sometimes abbreviated as “1:1”, allowing each enrolled student to use a personal device in order to access the Internet and course material digitally. The magnitude of this innovation was significant; in total nine schools with over 450 teachers and approximately 4.700 students, were provided with tablets, making the implementation one of the largest in Europe.

A special team, consisting of four individuals, was assembled to be in charge of the digital implementation in Kópavogur (Gunnlaugsson, Interview with the implementation team, 2018). Björn Gunnlaugsson, a teacher in Kópavogur, was hired as the project manager alongside three educational consultants; Eyþór Bjarki Sigurbjörnsson, Kristín Björk Gunnarsdóttir and Sigurður Haukur Gíslason. Those four were given the responsibility of implementing iPads into the everyday working environment of teachers and students in the municipality. Initially the team had their offices in one of the municipality´s schools but were later relocated to a location that has since been called “Snjallheimar” (Smart World). The team is often referred to by teachers, and themselves, as the “Snjallheima teymið” (Smart World Team).

The municipality not only supplied each student with iPads to use during school-hours, students were encouraged to take the iPads home with them at the end of the day and continue their explorations and studies after school. The ideology behind that decisions was based on the theory, described above as informal learning, that education and knowledge seeking can happen wherever, whenever and should not be confined to the teacher staffed classroom. (Livingstone, 2001) The decision put Kópavogur at the cutting edge of the global turn to technology, making it an important and interesting case study.

The policy introduced in Kópavogur contained five key goals to be implemented over the course of five years:

1) Students in the primary schools in the municipality should be able to use information technologies in their studies.
2) Information technologies should promote diverse teaching methods and practices in all subjects.
3) Students and teachers should take advantage of the possibilities offered by information technologies in studying and teaching.
4) Students and teachers should be allowed to use their own devices in teaching and studying if applicable.
5) School curriculums and strategies should address how each school is working to meet these requirements. [1] (Kópavogsbær, 2014)

Five years have passed since the plan was implemented. In this thesis I aim to examine the educators' progress and perceptions at these important crossroads. More specifically, I set out to answer the following research questions, motivated by and reflective of the policy goals set out by Kópavogur, as listed above:

Research questions:

1. Has the implementation of tablets affected the working environment of teachers in the municipality? If so, how? What do teachers see as advantages of the use of smart devices in the classroom? What do the teachers see as the pitfalls of the use of smart devices in the classroom, and how can these pitfalls best be mitigated?

[1] Translated from Icelandic by thesis author

2. Have the teachers been offered to actively participate in decision making and processes and in the creation of a vision for how technology should improve the working environment for teachers and students?
3. How were primary school teachers in the municipality motivated and trained to use ICTs in their teaching? Were these methods successful? Why or why not?

Of note, the technology, in itself, is relatively new. The first tablet computer from Microsoft was introduced in the year 2000 (Bort, 2013) and a decade later Apple introduced the first generation of iPads (Apple, 2010). Given this short timeframe there are, understandably, not many long-term studies on the impact of such devices in classrooms and a division of opinion seems to exist. Policy makers seem to be technologically optimistic and believe that the usage of information and communications technology (ICT), such as tablet computers, can help young people access knowledge and information, deepen their understanding of different subjects and aid them in their academic life. As well as preparing them for a future where technologies are deemed to play an ever-increasing role. On the other hand, there are those that have a more critical standpoint towards educational policy shifts with regards to technology. Concerns have been voiced about problems such as social isolation and lack of concentration among young people that dedicate long hours of their day to screen time. Furthermore, social media has been implicated in the deteriorating mental health of young people. (O´Keeffe & Pearson, 2011) Critical concerns where brought to the forefront in Iceland recently when one of the most prominent children´s psychiatrists in Iceland, Dr. Björn Hjálmarsson, was quoted in the largest Icelandic newspaper, encouraging educational authorities to reduce the use of tablets in schools while possible risks are still unknown and long-term studies lacking (Hallson, 2018) Dr. Hjálmarsson stated that the "screen-time" of children and teenagers is already quite extensive and when the implementation of the tablet technology began in the school-system, the "screen-time" became excessive in many cases. In addition, he has pointed out that, that to his knowledge, not one study has proven that using iPads or tablets in the classroom is in any way better than the traditional way of teaching.

This media attention has since led to public debates about the benefits of the technological focus in the educational system in Iceland. The case of the implementation in Kópavogur is the largest one in the country and has been the center of attention recently. Importantly, the implementation of smart devices affects not only the students who are to use the devices as material during their education, but also the working environment of the teachers and other staff in the institutions. Of note, hitherto, the bulk of studies and discussion on the subject has

been focused around the effects on students. However, the impact the introduction of ICTs has on teachers has not been studied at length. The aim of this thesis is to provide new information to fill this important knowledge gap.

Having been a teacher for eight years in Iceland I have a personal interest in the working environment of teachers. What is more, having been involved in policy making in the educational system in Iceland, I have been submerged in the discussion of technological progress and the need to emphasize digital literacy and digital citizenship from an early age. I believe evaluation of this changing landscape to be of immense importance, for students and teachers alike.

It would be fair to state that I, the author, am relatively technologically positive. I believe that if technology is integrated, properly, it can be of assistance for students and teachers alike and encourage a fair ground for all students and their styles of learning. One of the most important aspects of adapting digital technologies into the classroom, in my opinion, is to provide students the opportunity to develop their digital citizenship skills, to teach students to use mobile devices safely, correctly and responsibly. Access to up-to-date information is available to students through the means of digital technology and I believe it to be important to teach students to access information, evaluate it and think critically when they engage in information-gathering online.

3. Theoretical framework

3.1 Times of change

In the last 30 years technology has drastically evolved and advanced, as well evidenced by the introduction of the World Wide Web in 1990 and thereafter smartphones, tablets, lab-tops, the streaming of entertainment, access to information, affordability of powerful ICTs and the sociability made possible by Web 2.0. Since education aims, at least in part, to prepare students for the "real life" it is important that the educational experiences reflect the realities of the modern world. (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015) As societies evolve, and the demands for education change, the emphasis on digital technologies and digital literacy has increased. These technologies and new demands present fresh, and ever-changing, challenges to the profession of teaching. Through informal learning and informal teaching emphasis is laid on developing lifelong learners, and students are supposed to be taught how to "teach themselves". (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015) The so-called 21st century skills, needed for students to thrive in the environment of modern times, and the future alike, have been considered to be digital literacy, inventive thinking, effective communication, teamwork as well as the ability to create high quality projects. These are lofty goals and *"...educators need to focus technology on the key building blocks of student achievement*." (Firmin & Genesi , 2013, p. 1604)

Professor David Buckingham has pointed out that between the years of 2001 and 2005 ICT budgets in schools, in the UK, rose from £336 million in 2001 to £551 million in 2005, even excluding the substantial amounts of ring-fenced funding from the British Government. (Buckingham, 2007) However, as indicated by the same report, while the financial budget on ICTs increased teachers´ confidence and competence in using the technology actually declined. (Buckingham, 2007) Indeed, a certain imbalance has in some instances been introduced into the classrooms, caused by teachers´ lack of familiarity with modern technologies, as stated by Koehler and Mishra:

> "Teachers often have inadequate (or inappropriate) experience with using digital technologies for teaching and learning. Many teachers earned degrees at a time when educational technology was at a very different stage of development than it is today. It is, thus, not surprising that they do not consider themselves sufficiently prepared to use technology in the classroom and often do not appreciate its value or relevance to teaching and learning." (Koehler & Mishra, 2009, p. 14)

The theory of "informal learning" seemed relevant to the argumentation for utilizing the technology in the classroom, as well as outside the walls of educational institutions. Therefore, I incorporated "informal learning" into my theoretical framework. It also seemed sensible to look at the connection between spending money on technological devices by educational institutions and the confidence and competence of students´ that use those ICTs.

3.2 The "digital native" and "digital immigrant" debate

As the method used in this research was of inductive nature the analysis of the empirical data led me to findings that later influenced which theories and literature I looked into. Through the analysis I found that many of my interviewees referred to education in modern times to being far from up to date. Therefore, I started looking deeper into the debate about digital natives and digital immigrants.

Marc Prensky, arguably one of the most pro-technological scholars in the field, coined the terms digital natives and digital immigrants, referring to modern day students and teachers, respectively. (Prensky, 2001, p. 3) Prensky has claimed that digital immigrant teachers wrongly assume that contemporary learners are the same as they have always been and: *"…the same methods that worked for the teachers when they were students will work for their students now.*" (Prensky, 2001, p. 3) In claiming so, Prensky seems to believe that teachers ignore the immense technological shift that has taken place. Prensky however claimed that immigrants can, and must, learn to adapt to the environment in which they live and work.

> "The single biggest problem facing education today is that our digital immigrants, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language." (Prensky, 2001, p. 2)

Laurence Peters (2008), like Prensky, suggests that educational institutions should be doing more to draw students into a formal curriculum by celebrating, and taking advantage of how informal learning can build confidence and knowledge; that he deems vital to success of all students that wish to develop skills and interests over a lifetime. (Peters, 2008) This, Peters

argues, is likely to help with bulding the learners self-identity which he states is "*a fragile thing – once lost it is very difficult to regain.*" (Peters, 2008, p.115)

3.3 From a "sage on the stage" to a "guide on the side"

In 1993 Alison King wrote a paper titled *From the Sage on the Stage, to the Guide on the Side.* The paper focused on different methods utilized by teachers to increase students´ achievements. One of the findings was that learning in groups proved to be successful in setting up a condition of interdependence and group members had a tendency to:

> "…provide each other with elaborate explanations of concepts and processes so that everyone will understand the material and will excel on the tests." (King , 1993, p. 35)

The 21st century has seen a transition from the transmittal teaching model (more colloquially termed the sage on the stage model) to more active student learning. (King , 1993) According to the constructivist theory of learning, which has gained footing in recent decades, knowledge does not come packaged in books, or journals, or computer disks (or professors' heads) to be transmitted intact from one person to another. Rather, these vessels contain information. Knowledge on the other hand must be constructed - or reconstructed – by each individual knower. (King , 1993) In contrast to the transmittal model, commonly illustrated by the central and active lecturer and passive note-taking students, the constructivist model places students at the center of the process - actively discussing ideas and information. Thereby the educator transitions from the "sage on the stage" function to a "guide on the side", facilitating active learning. ICTs can play a central role in this process. The opportunities that come with informal learning are to open up new ways of learning and new approaches in education.

> "ICT challenges current descriptions and practices of pedagogy in terms of the perceptions of time, place, authority and purpose of teaching. Learning and teaching are often assumed to "take place" in particular slots of timetable in particular classrooms associated with particular curriculum subjects." (Loveless & Ellis , 2001, p. 4)

However, notably, a number of scholars have addressed that though students often use technology a great deal in the personal sphere this does not automatically translate into professional proficiency (Margaryan, Littlejohn, & Vojt, 2011). In a 2013 article written as an answer to Prensky´s *Digital Natives, Digital Immigrants* article, Ellen Johanna Helsper and Rebecca Eynon state that, in opposition to Pretsky´s claims, there is very little evidence actually

indicating that there as a radically different way young people use and process information compared to older individuals (i.e. teachers). Furthermore, they state in the same article that:

> "There is a growing body of academic research that has questioned the validity of the generational interpretation of the digital native concept." (Helsper & Eynon, 2013, p. 3)

They conclude, in their article, that it is important to understand learners in order to teach them well. They claim that education must not stagnate but also emphasize that debates about change have to be grounded in empirical evidence rather than in rhetoric. (Helsper & Eynon, 2013)

Even though the idea of Alison King, about the changes in the profession of teachers, did not refer to the usage of ICTs the ideology seemed to embody what has since been taking place in the classrooms in Kópavogur. If felt sensible to compare the statement, made by King that the role of the teacher is changing from being the all-knowing "sage in the stage" to becoming more of a "guide on the side" (King , 1993) to the experiences of the teachers interviewed, as well as the team in charge of the implementation. It was also important to take into consideration more critical approaches to the technological positivism that Marc Prensky described and mentioned above. Therefore, I sought after responses in academic literature and found criticism, such as the article by Helsper and Eynon quoted above.

3.4 Mobile devices changing the educational system

Mobile learning or learning through the channels of mobile devices and ICTs are often regarded as a necessity in order to change education and make it more in line with that which is going on in society. (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015). However, handing out iPads should not, in itself be expected to increase student achievement and enthusiasm for learning. (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015) Michael B. Horn, education expert and author of *Blended: Using Disruptive Innovations to Improve Schools* and *Disrupting Class: How Disruptive Innovation Will Change the Way the World Learns* stated in a presentation in 2014 that:

> "Purchasing and distributing devices should never mark the beginning of a mobile learning initiative; successful technology integrations occur only after careful planning, strategy, and continuous refinement." (Horn, 2014)

The handing out of ICT´s cannot be considered to automatically improve achievements and skills of students or teachers. Furthermore, as will be made evident in the analysis part of this

thesis, there was some confusion in regard to what would happen once teachers and students were given their devices.

3.5 Involving all stakeholders

An important aspect of a technological innovation and implementation of new technologies into the working environment of students and teachers alike is to have all stakeholders involved in the process, (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015) stakeholders in this case refers to those affected by the implementation and are in participants in the decision-making processes and execution of the implementation. The success of such integration is largely dependent on how the educators, or teachers and the students, feel about the procedure. (Migliorino & Maiden, 2004) Thus, it seems of utmost importance to focus on encouragement for teachers to become familiar with the possibilities and potential usages of the devices which they are expected to use in their classrooms. According to Firmin and Genesi (2013) technology still has a tendency to be viewed "*almost timidly by many educators today*." (Firmin & Genesi, 2013, p. 1064) If the issue is, as Buckingham (2007) states:

> "Not *why* or *whether* to adapt technology, but *how*…a mentality that leads to a discourse of inevitability from which it is impossible to dissent – unless, of course, one wishes to be labelled as a hopeless "dinosaur". (Buckingham, 2007, p. 16)

Buckingham goes on to state that clearly there will be a difference between teachers, of their attitudes, their confidence levels and emotional or cognitive styles that will, ultimately, influence their willingness to engage. (Buckingham, 2007)

The issue of time is often highlighted as a concern in studies of the work of teachers since teachers´ time is "*laden with concerns about being "productive" and "effective" in terms of achieving learning and student outcomes*". (Selwyn, 2011, p. 105) Digital technologies can lead to intensification of teachers work, impacting and affecting the nature and meaning of tasks and activities in their working environment. (Selwyn, 2011)

The importance to keep lines of communications clear and cater to the needs of all stakeholders was evident in the empirical data. Therefore, it seemed relevant to look into how communications took place, and the effects on the communications on all stakeholders.

3.6 About teachers, teaching and changes

The philosopher John Dewey reflected on the place of schools in communities and the intimate relationship between democracy and education. He argued that in modern[2] societies, industrial world, democracy was an impossibility unless children were educated not only about specific subject matters, such as geography and mathematics, but they should also have access to common knowledge and values as well as understandings. (Reese, 2010)

> "The methods by which the children were taught – a time-reversed emphasis on rote memorization and recitation of knowledge learned from textbooks – was mind-numbing but, Dewey argues, schools were integral to accessing and transmitting knowledge in the modern world. The scientific and technological innovations of the past half century, which underpinned the industrial revolution, destroyed traditional crafts and time-honored ways of living." (Reese, 2010, p. 147)

Dewey feared that if children were not exposed to this recent rise in knowledge and taught to be independent, creative thinkers they would not be prepared for the tasks of being citizens in a modern civilization, where people lived in cities and things developed and changed at a fast pace. In his opinion democracy was bound to wither if not for effective schools to prepare young students for life in this modern world. (Reese, 2010)

> "I believe that all education proceeds by the participation of the individual in the social consciousness of the race. This process begins unconsciously almost at birth, and is continually shaping the individual´s powers, saturating his consciousness, forming his habits, training his ideas, and arousing his feelings and emotions." (Dewey, 1897, p. 77)

Dewey believed that the school was most importantly a social institution and education to be a social process. A process of living, rather than to serve as preparation for future living. According to his point of view schools should, as institutions simplify the existing social life and reduce it "*as it were to an embryotic form*." (p. 77) This was to be done due to the complexity of life, so that the student would be have a change to adapt to social life in a more suitable, age and development appropriate ways. (Dewey, 1897)

[2] Here it relevant to point out the modern, in this context, refers to what was modern for John Dewey as the text was written before the turn of the 20th century.

The schools, as institutions rely on teachers as the educators of students. Teachers are paid professionals, and their occupation is to instruct and help their students to acquire knowledge. However, there is often little time for thinking things through rationally as there are constant disruptions in the teachers´ environment, both from within the classroom and from the outside. (Fullan, 2001) Within the classrooms disruptions and distractions may come in the form of maintaining discipline and class management, distractions from the outside might include dealing with the office staff, the principal or parents, as well as making announcements and or collecting money for school related events. (Fullan, 2001)

These distractions and the complexity of the profession can lead to stress and can affect teachers in various ways. Known effects include exhaustion of energy, isolation from other adults and meaningful communications with colleagues. In addition to that the profession has been in a state of erosion and the status and recognition of the teacher profession has decreased in recent years. The pace has increased and so has the workload according to Fullan (2001).

To teach in modern times is a very different task than it was in the last decades. Societies have changed profoundly and obviously there is a need to remodel the educational systems, to make them more flexible and in a better agreement with these new realities. (Esteve, 2000)

> "Teachers faced with social change are like a company of actors on stage in period dress who are subjected to a sudden change of scenery in the middle of an act. A new backdrop is quickly rolled down to hide the previous scenery. The new scenery is postmodern; there are lively fluorescent colors that contrast completely with the classical atmosphere on the stage seconds before." (Esteve, 2000, p. 198)

Such is the description that José M. Esteve gives readers in an attempt to shed a light on the reality of teachers in modern educational systems. He continues and speaks about difficult and demanding working conditions of teachers that can, ultimately, lead to "teacher stress" and "teacher-burnout". He outlines how teachers have been observed and described in pedagogical literature as "…*worried, tired or exhausted by their experiences in the classroom*." (Esteve, 2000, p. 198)

> "Fragmentation of the work of teachers and the associated decline of quality are characteristics of the educational system today, and they occur in spite of the fact that this is supposed to be the age of specialization in which specialization is seen to be fundamental for quality education." (Esteve, 2000, p. 206)

New problems facing teachers are partly spawned from technological changes, moral and social changes. To emphasize these changes Esteve finds and describes several indicators of change in the last years, including:

> "increasing amounts of responsibilities, more often having to tend to the needs of students with special needs, caring for the psychological equilibrium of the pupils, helping their social integration and attending to their sexual education." (Esteve, 2000, p. 199)

On top of that, teachers are also expected to fulfil educational responsibilities outside the school, "to contribute to social, civic and moral education of their students". (Esteve, 2000, p. 199) As society is becoming more pluralist, according to Esteve, there are different social groups to be found that have different educational models and within each model there are priorities towards various values. This leads to a need to change teaching materials and methods to meet demands of more diverse teaching. Esteve states that for the first time in history teachers are not merely expected to help prepare new generations for the present needs of society, they are asked to prepare students for meeting needs in the future society, a society that does not yet exist. (Esteve, 2000)

With these problems facing the profession of teachers it seems clear that changes are inevitable, but then again, changes lead to struggle, stress and even anxiety among teachers, (Fullan, 2001) so therein lies a dilemma. To bring about change certain elements have to be aligned. Michael Fullan draws two conclusions regarding educational changes, one is that change is bound to fail until a certain way is found to develop infrastructures and processes that engage educators in their development of new understandings. The second one is that the focus is not, or should not be, on surface meaning, rather a deep meaning about new approaches to teaching and to learning. Fullan insists that there is a possibility to clarify the meaning of educational change, objectively, by pinpointing and describing main separate dimensions of the change at hand. Of note, Fullan pointed out the danger that a given objective reality might only be a reflection of the producers of change, making it a "*glorified version of their subjective conceptions*" (Fullan, 2001, p. 38)

In driving educational changes towards becoming successful there are many aspects that need to be taken into account, according to Fullan. Active initiation is among those; to start small albeit thinking big. This may serve to make the change more manageable and lay the tracks in a desirable direction. In order to do so it is important that participation, empowerment and initiative-taking are key factors from the very beginning. Fullan also argues that both pressure and support are necessary for success as pressure applied without support will lead to resistance and alienation and support without pressure can lead to a waste of resources. Fullan notes that changes in behavior often come before changes in belief, and things often get worse before they get better during changes, a phenomenon Fullan has coined "*the implementation dip*". (Fullan, 2001, p. 92) The implementation dip is something that Fullan claimed people often suffer when they experiment with something new and the tendency for things get worse before they get better and clearer as people struggle with changes, new meanings and skills.

According to Fullan virtually every study on the topic of educational change found that:

> "…within the school, collegiality, among teachers as measured by the frequency of communication, mutual support, help and so forth, was a strong indicator of implementation success." (Fullan, 2001, p. 124)

There is a strong need for teachers to maintain personal contact in order for successful change. Teachers should be afforded opportunities to receive and give help, and to converse about the meaning of the changes taking place. In Fullan´s words:

> "Purposeful interaction is essential for continuous improvement." (Fullan, 2001, p. 124)

Fullan emphasizes the importance of the voice of the teachers to be heard:

> "…education change depends on what teacher´s do and think – it´s as simple and complex as that." (Fullan, 2001, p. 115)

He introduces the findings of a study conducted and published in 1998 where it is stated that once teachers develop a more extensive say in school decision making they are likely to begin experimenting with new roles and even work more collaboratively, creating grounds for teachers to feel more at ease with exchanging ideas and establishing a collective sense of responsibility for development. Fullan also emphasizes the importance of consultants, and the consistent conclusion that in order to improve schools systems there is a need to reach to the outside. (Fullan, 2001) Many researchers have emphasized and elevated the importance of help and support for teachers during the early stages of technological innovations and

implementations while teachers find their footing and a new balance, among those are Shazia Mutmaz (2000), John Traxler and Steve Vosloo (2014).

3.7 Communications, participation, authority and empowerment

Organizational communications refers to information received by employees about the functioning of the organization in which they work and can be characterized as a one way, "top-down" informational stream whilst participation is a "bottom-up" information activity. (Elst, Baillien, Cuyper, & Witter, 2010)

> "It (organizational communication) concerns both the quantity and quality of the information value of the communication. Organization participation is defined as the degree to which employees have over decision making." (Patterson, et al., 2005, 382)

According to Therese Hedman Monstad (2015) many initiatives and methods are known and used to encourage, engage and empower organizational members to participate in the organizational work. One of these methods is Total Quality Management, an on-going change process used among business organizations meant to engage members and encourage their participation and contributions. Total Quality Management is a management approach with the aim of long term success provided by customer satisfaction. Where the approach is used effectively, all members of the organization involved are to participate in processes of improvement. (Bhat, 2009) Monstad claims that methods such as Total Quality Management are not only found among business organizations, but have also been utilized by governments, hospitals and non-profit organizations to enable member empowerment and participation. (Monstad, 2015) The management approach has also been utilized in educational processes. (Sallis, 2002)

Monstad points out that constant struggle exists between change and stability. Workers need to adjust their work in response to their environment and the senior managers need to maintain the stability, by ensuring that both internal and external environments know what to expect. This process, Monstad claims, can lead to tension. (Monstad, 2015) Many scholars, according to Monstad, see tensions as unavoidable and present in organizations and a tension-centered approach should be used when studying organizations as it may lead to a deeper understanding and aid theory building. By exploring how tensions emerge and are acted upon within organizing processes there might be a way to aid member empowerment and participation. Empowerment can, in some cases, Monstad notes, challenge processes of participation "when

organizational members are given more responsibility but not the tools, (in form of, for example, time and knowledge) to handle this responsibility." (Monstad, 2015, p. 48)

Marc Zimmerman (2012), wrote an article titled *Empowerment Theory: Psychological, Organizational and Community Levels of Analysis,* in which he aimed to shed a light on empowerment and in which settings empowerment is made possible.

Zimmerman defined empowerment based on two former definitions, one from The Cornell Empowerment Group and the other from David Mechanic.

> "Empowerment is an intentional, ongoing process centered in the local community, involving mutual respect, critical reflection, caring, and group participation, through which people lacking an equal share of valued resources gain greater access to and control over those resources. " (Cornell Empowerment Group, 1989)
>
> "Empowerment may be seen as a process where individuals learn to see a closer correspondence between their goals and sense of how to achieve them, and a relationship between their efforts and life outcomes." (Mechanic, 1991, p. 4)

Zimmerman also adresses a definition that originally stems from Rappaport (1894) where it is stated that "…*empowerment is viewed as a process: the mechanism by which people, organizations, and communities gain mastery over their lives*." (Rappaport, 1984, p. 2)

In summarizing these three defintions Zimmerman states that they suggest, collectively, that empowerment is a prcocess where efforts to access or exert control are central and that basic components of the construct are in participation with others in seeking to achieve goals, efforts to access resources and some critical understanding of the sociopolitical environment.

Zimmerman emphasized that all participants in change, within a community or an organization, should have an active role in the process for the approach to be empowerment orientated. Their role should not be limited to implementing change but also in setting the agenda. According to him, participants could share their knowledge and prove helpful during the identification of issues, measuring them and helping collect evaluation data. Furthermore, attention should be focused on how goals are achieved, not solely on outcome. Empowering processes vary across levels of analysis according to Zimmerman, on individual basis such processes may include organizational involvement or involvement in a community. On an organizational level, the process might include sharpening of leadership or decision-making, and an empowering process on a community level may include accessible government, media or other community resources. (Zimmerman, 2012,)

In her article, *Change processes, practices of authority and communication: authority negotiations between managers and employees in two medical companies* Monstad relies on a definition of empowerment that was, originally provided by Page and Czuba (1999):

> "Empowerment is a multi-dimensional social process that helps people gain control over their own lives. It is a process that fosters power (that is, the capacity to implement) in people, for use in their own lives, their communities, and in their society, by action on issues that they define as important." (Page & Czuba, 1999, p. N/A)

Monstad points out that Mary Parker Follet introduced the notion of "power with", where Follet distinguished between "power over" and "power with". The idea introduced was that organizations would be democratic if organization members or employees could exercise their power at all levels of the organization through means of participation, education, empowerment and pluralism. (Monstad, 2018) Notions of power and authority, and how to distinguish the relationship between the two, have been the subject of debates among scholars for a long time, according to Monstad. She states that some, among the critical scholars, have argued that power indicates authority while other are not in agreement and argue that one does not imply the other. Monstad notes that many do agree that authority is, in its nature, empowering but always restrictive in the sense that it is controllable, can be delegated or even withdrawn. Monstad points out that those that are critical of empowerment as an active approach have argued that empowerment can be used as a way of exploiting workers through the use of rhetoric. Monstad also discusses "bogus empowerment", a term introduced by Joanne B. Ciulla. The term refers to processes where subordinates are given additional responsibility without the extension of control or additional time to cope with the increase in responsibility. The opposite of "bogus empowerment" is "authentic empowerment" referring to empowerment processes where subordinates are given control over outcomes, thus making them more responsible for their work and the ultimate outcome.

Within an organizational setting, like that of the educational institutions in the municipality of Kópavogur, changes need to be communicated. Looking into organizational communications, participation of employees, their sense of authority, and their feeling of empowerment, or lack thereof, seemed important and increasingly so as the empirical data was analyzed.

3.8 Focusing on the teacher

Importantly, the bulk of research on the use of technology in the classroom centers on students and their experiences (Prensky 2001; Helsper and Eynon 2010; Bennett & Maton, 2010; Jones et al. 2010). Recently, however there has been some work focusing on educators (Kalonde & Mousa, 2016; Rani, Srivastava, & Vyas, 2016). These studies have centered primarily on teachers´ attitudes towards technological shifts *per se* (Gu, Yuankun, & Guo, 2013) or the repercussions of the different levels of proficiency of teachers on the one hand and students on the other (Prensky 2001). The central role of the teachers in secondary education during an implementation process in Belgium is the subject of a study conducted in Flanders, Belgium (Montrieux, Vanderlinde, Courtois, Schellens, & Marez, 2013). By contrast, this thesis focuses instead on the organizational procedures, tools and processes used to help teachers work in this new landscape. In other words, the aim is to better understand the support structures and communicational strategies that can help bridge the distance between digital natives and digital newcomers.

As stated by Mishra and Koehler (2006) research conducted in the field of educational technology has been criticized on the grounds of lacking theoretical grounding. Their answer to such criticism was the construction of the Technological, Pedagogical, Content Knowledge (TPACK) theoretical framework. The model, they argue, attempts to capture essential elements and qualities of teacher knowledge that is required for the integration of technology in teaching. This knowledge they deemed to be multifaceted and complex and situated. (Mishra & Koehler, 2006)

The TPACK model builds on Lee Schulman´s construct of pedagogical content knowledge and has been deemed critical to effective teaching with technology, as it takes into consideration how the inclusion of technology in pedagogy complicates teaching. An article by Koehler and Mishra, published in 2006[3], describes the work of the teacher as being "a complex cognitive skill occurring in an ill-structured, dynamic environment" (Mishra & Koehler, 2006, p. 1020), requiring teachers to apply complex knowledge structures across different cases and contexts. It is also stated that it is clear that many knowledge systems prove to be fundamental to teaching; among those are the knowledge of student learning and thinking,

[3] At the time of the publishing, the framework was called The TPCK framework, the "A" was introduced later on.

and knowledge of the subject matter at hand. Thus, effective teaching depends on flexible access to rich, well-organized and integrated knowledge from different domains, including knowledge of technology. (Glasser, 1984; Koehler & Mishra, 2009; Putnam & Borko, 2000; Shulman, 1986, 1987) According to the TPACK framework the main components of teacher´s knowledge can be divided into three components, namely content, pedagogy and technology, but apart from looking at each of the components in isolation it is also important, according to Mishra and Koehler to view them in pairs, that is to say how they intersect and affect one another. In doing so they could be viewed as pedagogical content knowledge (PCK), technological pedagogical knowledge (TPK), technological content knowledge (TCK) and when they are all viewed together as a whole, technological pedagogical content knowledge (TPCK) (Figure 1) (Koehler & Mishra, 2009).

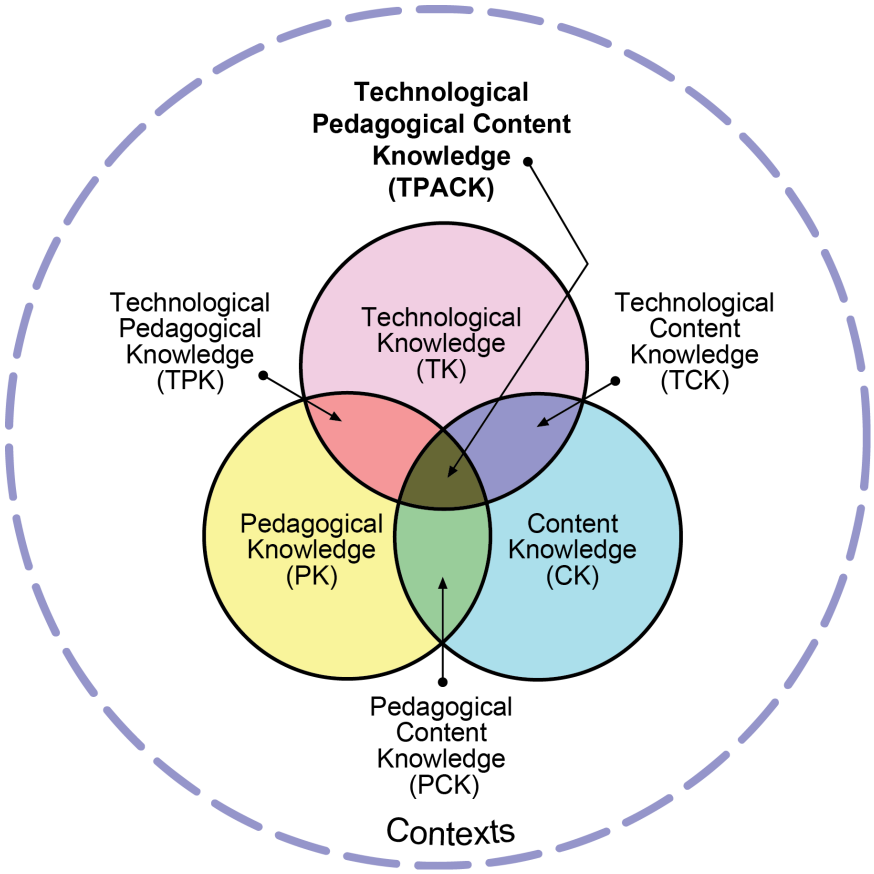

Figure 1. A visual presentation of the TPACK model. Published in the paper *What is Technological Pedagogical Content Knowledge?* By Matthew J. Koehler and Punya Mishra, 2009, in *Contemporary Issues in Technology and Teacher Education*

Mishra and Koehler deemed that having a suitable framework could offer researchers new and different ways of looking at and perceiving a given phenomenon and additionally offering

information that could be used to base pragmatic and sound decisions upon. (Mishra & Koehler, 2006)

> "Theories, frameworks, or models can be seen as conceptual lenses through which to view the world. They help us identifying objects worthy of attention in the phenomena that we are studying, highlight relevant issues and ignoring irrelevant ones. They can work as classification schemes by providing insights into the nature, and relationships of the objects under scrutiny." (Mishra & Koehler, 2006, p. 1043-1044)

The TPACK framework is, then, meant to make sense of complex relationships that exist, and occur, when teachers add technology into their classrooms, and apply technologies to teaching of a specific subject matter. Allowing for conceptualization and discussions about the complex relationships in a manner that is methodological and well grounded. "*This not only helps us identify phenomena in the world, but it also gives us a language to talk about it*." (Mishra & Koehler, 2006, p. 1044)

Successful integration of technology in the classroom hinges, according to Punya Mishra, William Cain, and Matt Koehler on a combination of teacher´s technology, pedagogy and content knowledge or TPACK (Koehler, Mishra, & Cain, 2013) , and thus it is important to ensure that teachers are prepared for the usage of technology in their working environment, especially considering that many of the teachers, of today, earned their degrees when educational technology was at a "very different stage of development than it is today." (Koehler, Mishra, & Cain, 2013, p. 14)

I will use the TPACK model to explore the implementation of iPads into the working conditions of the teachers in Kópavogur, and attempt to shed some light on the implementation procedure and its impact.

3.9 A framework for integration of ICTs into the classrooms

Donnelly, McGarr and O´Reilly (2011) developed a framework for integration of ICT into teachers´ classrooms. According to their article, *A framework for teachers´ integration of ICT into their classrooms practice:*

> "Structural and cultural changes to schools make little improvement unless the importance of teachers is taken into account from their construction of "the reality of educational practice on a day-to-day basis and their schools and in their classrooms" (Donnelly, McGrarr, & O´Reilly, 2011, p. 1469)

This they deemed not to be surprising on the grounds that any form of change, ultimately, leads to intensification of the teachers´ work by adding duties and responsibilities when their profession is already very demanding. The authors claim that teachers often feel an absence of ownership on the development of curriculum and changes and, on those grounds, teachers do not engage with such work. They emphasize that school systems and authority agencies have not figured out how to establish a fruitful relationship with each other. In educational change there needs to be co-operation and partnership that takes into consideration the responsibilities and rights of all stakeholders. Further issues are then brought about with the implementation of ICTs into the educational change processes, according to the authors.

For a technological innovation to be successful there are a number of factors to be taken into account, among those factors are, according to the article, human infrastructure, technological infrastructure and social support. Another crucial aspect to take into consideration is:

> "…the compatibility of teacher´s pedagogical beliefs and the technology being used. If teachers´ use of technology is to change then their beliefs about the technology has to change." (Donnelly, McGrarr, & O´Reilly, 2011, p. 1470)

To understand teacher´s use of any new technology there is a necessity to grasp the knowledge and beliefs that underlie this practice. These were the foundations that the authors used to formulate their model, or framework, to acknowledge different stances among teachers in regard to technology integration, with the significant and important differences between these stances being highlighted.

> "In relation to empowerment and fatalism, the findings highlight how some teachers see ICT as an opportunity for them to do something new and interesting with their students in term of how the students learn while other teachers feel it is beyond their control to do anything about the types of ICT resources they have within their classroom." (Donnelly, McGrarr, & O´Reilly, 2011, p. 1477)

The model identifies four "types" of teachers in relation to an ICT implementation into their practice: the contented traditionalist, the selective adopter, the inadvertent user and finally the creative adapter. The four types, identified by the authors, will be described below in terms of their focus, their level of ownership and their pedagogical content knowledge (PCK)

The contented traditionalist is focused on assessment with limited methodology use. The curriculum, school management and the principal are the underlying reasons for their focus. There is a lack of intrinsic motivation that relates to the fatalist views of the educational systems within which the contented traditionalists work. Among those there is no urgency in using computers or ICTs when traditional practices continue to work. The authors deem that contented traditionalists would not be critical towards the syllabus. Among them there would not be a strong sense of ownership, their actions and practices would be "*strongly swayed by the prevailing culture within the school*" (Donnelly, McGrarr, & O´Reilly, 2011, p. 1478) and would be considered to have a low PCK as the would only adapt to using ICT tools if it becomes the norm in their institution and culture.

The selective adopter would be focused on assessment with varied methodology use. A selective adopter would have a strong urge to see his students do well and would, within the system that the selective adopter works, work hard to maximize the student´s success. The sole reason for adopting to, and continue to work with, ICTs would be that it would prove helpful for the students. The selective adopter is deemed to have strong sense of ownership as well as empowerment, as the selective adopter strives to be successful within the educational system. The PCK would be considered high, but in a limited sense.

The inadvertent user would be considered an accidental user of a particular ICT and would be deemed not to have a specific focus. The inadvertent user would not be considered skillful or competent in using ICTs. The reasons to take up ICTs in the classroom for an inadvertent user could be prevailing culture within their school, a sense of external pressure or curiousness, but always with some hesitation. There would be a lack of ownership in the usage of a new resource in the classroom, PCK would be relatively low and a reliance of feedback from other sources would be heavy as the confidence in the user´s own ability would be low.

The creative adapter would have a strong focus on approaches that were student centered and would emphasize meaningful learning for the students. A creative adapter would have more well-rounded educational experiences than the fellow teachers. A strong sense of empowerment would be evident in their methods and classes, as would a critical view of the content of the syllabus. The creative adapter would have a rich variety of PCK which would be utilized in all classroom practice.

After characterizing the types of teachers, the article´s authors then wonder whether the positions of teachers are fixed or if teachers can move between groups, so that for instance, an

inadvertent user could become a creative adapter. The authors gather, and hope, that the positions are not fixed. They conclude that the model can serve as a helpful foundation to educational stakeholders who plan on integrating ICTs as resources into their institutions and that once it has been interpreted which stage, or type the teachers belong to, relevant strategies can be considered to maximize the positive outcomes of the implementation. (Donnelly, McGrarr, & O´Reilly, 2011)

Michael Fullan stated that the majority of researchers in the field of educational change divide the change process into three broad phases. The first phase is focused on the process leading up to and includes the decision to proceed with a change, this first phase is variously labelled, sometimes referred to as initiation, mobilization or adoption. The second phase is then often referred to as the implementation, or initial use and usually refers to the first two to three years of usage. This phase is focused on the first experiences and attempts to drive a change, put and idea into practice. The third, and final, phase has been labelled incorporation, continuation, routinization or institutionalization and refers to whether the change is considered successful and build in as an ongoing part of a system. (Fullan, 2001)

I similarly used this method of dividing the implementation of iPads in the municipality of Kópavogur into three phases. That was done to encourage the interviewees to set their focus in recalling memories from different phases of the implementation, in attempting to get the most accurate information from different stages of the process.

4. Methodology

Alan Bryman (2012) describes phenomenology as the philosophy that concerns itself with questions of how people make sense of the world around them. (Bryman, 2012) Realism he described as the ideology or philosophy that argues that there is reality, external and separate from our descriptions of it. (Bryman, 2012) I set out with the aim to accumulate data through a subjective approach, an emic epistemology. My ontological position for this research was of a phenomenological, realist nature. I sought to collect first-hand information from the participants in the study about their lived reality and emotions in regard to changes in their workplace and their experiences, in order to understand their environment.

In the gathering and presenting of data, for this thesis, a mixture of qualitative and quantitative methods was chosen, with an emphasis on qualitative methods. That research strategy was chosen on the account of being the most suitable to seek the answers to the initial research questions, to describe the social experiences and the lived realities of the teachers in the municipality of Kópavogur. According to Jennifer Mason (2006), there is great value to be found in mixed-methods approaches when researching questions about social experiences and lived realities:

> "Mixing methods helps us to think creatively and "outside the box."" (Mason, 2006, p. 9)

Mason suggests that a qualitative driven approach can offer: "…enormous potential for generating new ways of understanding the complexities and contexts of social experience, and for enhancing our capabilities for social explanation and generalization." (Mason, 2006, p. 10) In addition, there are particular strengths to be found in qualitative research that:

> "Lie in the knowledge it provides of the dynamics of social processes, change and social context and its ability to answer "how" and why questions in these domains." (Mason, 2006, p. 16)

Induction is a concept often associated with qualitative methods, and my approach was of inductive nature. David R. Thomas (2006), stated in his article, *A General Inductive Approach for Analyzing Qualitative Evaluation Data:*

> "I have found that many researchers and evaluators, who are unfamiliar with any of the traditional approaches to qualitative analysis, wish to have a straightforward set of procedures to follow without having to learn the underlying philosophy and technical language associated with many qualitative analysis approaches." (Thomas, 2006, p. 238)

Thomas then continued to state that the evolution of the article stemmed from the need to provide researchers with a "*brief, nontechnical set of data analysis procedures*." (Thomas, 2006, p. 238)

Initially I had formulated specific research questions, but eventually the empirical data generated meanings that had not been foreseen, relationships and patterns. The research questions were therefore altered in order to better fit the data, as had been foreseen. The qualitative research interview approach was chosen since it was deemed the likeliest to gather highly descriptive information and data. Qualitative research can be used to provide in-depth description and understanding of interactions and processes that occur in real life organizational context. (Seale , 1999) Using interviews to gather empirical data is well known practice and often used in qualitative research, Professor Steinar Kvale describes the agenda of qualitative research to be to:

> "…approach the world "out there" (not in specialized settings such as laboratories) and to understand, describe, and sometimes explain social phenomena "from the inside" in a number of different ways" (Kvale, 2007, p. 21)

In order to understand the reality in which the teachers of Kópavogur found themselves, during the implementation period, and since the iPads have been integrated into their working environment two teachers from all nine schools in Kópavogur were interviewed, a total of 18 teachers. All interviews were conducted in Kópavogur in February and March of 2018. Teachers were randomly picked from the staff in order to increase reliability and validity of the study results. My gatekeeper to the schools and administrators was the project´s manager, Björn Gunnlaugsson. Mr. Gunnlaugsson helped me contact the school´s administrators and principals and I was thereafter appointed time with the teachers. We met on schoolgrounds during working hours. I had with me a list of 21 questions that I wanted to ask the teachers (see Appendix), but the conversations were not rigidly controlled by my questions, rather they were meant to flow somewhat naturally. The estimated time for each individual interview was, beforehand, approximately an hour but ultimately the interviews were closer to 40 minutes

each. The policymakers that formulated and implemented the policy shift in Kópavogur were also interviewed, using the aforementioned list of questions.

The method of using a semi-structured interview is, as stated earlier, a well-known practice, where the researcher conducts a planned and flexible interview with the purpose of obtaining descriptions of the world of the interviewee. (Kvale, 2007) According to Kvale the interview is a uniquely sensitive and powerful method for understanding the experiences of the subjects´ everyday world. During an interview, such as those conducted with the teachers and implementation team in Kópavogur, the aim is to seek qualitative information and knowledge expressed in a common day language, in order to understand a certain experience from the subject´s point of view. The teachers and implementation team were anonymized and given pseudonyms. The aspect of anonymity in the research is better described in the chapter *Ethics.*

All interviews were recorded on a digital recording device in the native language of the teachers and the researcher, namely Icelandic. The interviews were then transcribed, in Icelandic, coded into clusters and patterns and the coding thereafter translated to English, as well as a big part of the interviews considered of importance. "*A code in qualitative inquiry is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data*." (Saldaña, 2009, p. 3) Among the data that can be coded are interview transcripts, literature and participant observation field notes. Saldaña emphasized, in his book about the phenomena, that coding is not a science that can be precisely summoned up, rather it is an interpretive act and each researcher finds his or her suitable way of coding data collected. In the coding of my empirical data I initially coded a single interview, in order to try and find the core meaning of the data, I looked for repetitive patterns documented in the data. I tried to categorize the data and cluster things depending on relevance. Saldaña claimed that coding can be considered heuristic, that is to say that it is "an exploratory problem- solving technique without specific formulas to follow." (Saldaña, 2009, p. 9) I found, much like Saldaña described, that coding is an act that happens in cycles as I coded the empirical data again and again, in attempting to compare meanings found in the material, generating themes as well as categories and grasping meaning. I tried to arrange my finding in a systematic order, to find correlations and build clusters from those. I would deem, that ultimately my approach to coding would have been what has been called "value coding", "descriptive coding" and "pattern coding". I then used what has been called "in vivo coding" in the presentation, which means that the data was kept rooted in the interviewees own language. (Saldaña, 2009)

Lastly, the implementation team has collected and posted a great deal of information online (and thereby sought to keep the implementation process transparent) and data was gathered from this online source: http://spjaldtolvur.kopavogur.is/

The empirical data was analyzed through inductive reasoning, that is to say, taking into consideration the dynamics of the information from the data prior to founding them in theory. According to Jens Rennstam and David Wästerfors (2015), there are three methods that make up the analysis of qualitative data; to organize or sort the data, to reduce it and finally to make an argument. (Rennstam & Wästerfors, 2015) The first method of sorting or organizing they call the problem of chaos, since it involves finding clarity or order in the disorder of the data. The second one, the reducing of data, the authors call the problem of representation since it is impossible for a researcher to refer to everything found in the empirical data. Finally, the argumentation the authors coin as the problem of authority, which refers to the stage where the researcher tries to make him- or herself heard among other researchers and the academic community. (Rennstam & Wästerfors, 2015) Upon analyzing qualitative data there is no one way to do so according to Russell K. Schutt. (2014) He states that from a hermeneutic perspective, each individual researcher constructs a "reality" by interpreting texts that are provided by the subjects of research. (Schutt, 2002) The hermeneutic perspective, according to Schutt, can also be that the interpretation of text can never be deemed true or false as it is only one interpretation of many.

During the analysis of the data, in this thesis, I coded the interviews three times and made an effort to sink myself in depth and detail into the empirical data, trying to find meaningful units. I was careful in trying to leave all biases behind me and did my best in remaining sensitive to the context of the data for it to be as value free and "pure" as I could. Conceptualization helped me reduce the data as I soon identified concepts of importance and worked my way from there.

Conducting qualitative research involves examining, exploring and describing people in their natural environment, as stated above. Embedded in such research is a relationship between the researcher and the participants according to researchers Orb, Eisenhauer and Wynaden (2000) All of the individuals that partook in the research offered their full consent and prior to the interviews I introduced myself, the institution from where I was conducting my study, namely the University of Uppsala, and the purpose of the study. I did my best to make the setting of each interview relaxed and comfortable for the interviewees and establish grounds for a positive relationship. An essential part of research ethics concerns the questions of how

participants, be they subjects or informants, can be treated and ensuring that they be protected from harm in connection with their participation. (Swedish Research Council, 2017) According to Orb, Eisenhauer and Wynaden ethical issues are present in any kind of research. They claim that the processes of conducting research "*creates tension between the intention of research to make generalizations for the good of others and the rights of participants to maintain privacy*" (Orb, Eisenhauer, & Wynaden, 2000, p. 93) By applying the appropriate ethical principles harm to participants can be reduced or prevented all together. Even though researchers are prepared and have applied ethical principles they are often find themselves in ethical dilemmas when conducting interviews, those dilemmas are difficult to foresee but nonetheless the researcher must be aware of potential conflicts of interests and sensitive issues. (Orb, Eisenhauer, & Wynaden, 2000) While analyzing the empirical data I tried to maintain the privacy of the participants in the study.

4.1 Ethics

Personal permission was obtained from all interviewees. Furthermore, permission to interview teachers was obtained from the educational board of Kópavogur and from all school principals. Teachers were promised anonymity and that their answers and replies would not be associated with their names and workplace. According to Annukka Vainio:

> "Anonymity has traditionally been considered as one of the elements of research ethics, the purpose of which is to protect participants from harm." (Vainio, 2012, p. 687)

In the case of the teachers in the municipality of Kópavogur there might not have been an imminent threat of physical harm, but nonetheless, their answers associated with their names might cause tensions in their relations to their superiors and the implementation team. The names of teachers were replaced with pseudonyms, as suggested as a method by Vainio (2012). However, Vainio points out that some researchers believe that individuals that speak from a professional position should not be made anonymous. (Vainio, 2012) Members of the implementation team were also assigned pseudonyms in order to minimize risk of future tensions in the workplace. Aspects of the general findings from the interviews with the teachers were reflected with the team in charge of the implementation, but in a manner in which the anonymity of individuals was secured. That is to say, the only findings from the teachers interviews that were discussed were general and common answers.

5. Results

5.1 Interviews with teachers

The 18 interviews conducted with teachers are analyzed in the following chapter. All interviews, both with the teachers and implementation team, were conducted according to the preformed interview guideline with the aim of addressing three separate phases of the implementation:

1. Reflections on the time of the initiation of the implementation and when the devices handed over to the teachers, with emphasis on communication between the implementation team and teachers as well as the support offered to teachers in the early stages (Phase 1).
2. Views on the implementation process and how things are going in the present time with emphasis on the role of feedback and ongoing support (Phase 2).
3. Discussions about certain elements often addressed in the literature on teaching and ICTs, such as the changing role of educators and the shifts in teaching methodology due to increasing use of digital educational tools (Phases 3).

The teacher´s answers denote a certain polarity, namely that those that were more positive from the beginning felt that their opinions were of relevance and that they had a say in the execution of implementation. However, those that described feelings of reluctance in the beginning felt that their criticism and opinions were not appreciated or even paid attention to and they received less support during the process. This polarity is reflected it in the setup of subchapters of the analysis.

To ensure anonymity teachers have been given a pseudonym consisting of the letter “T”, (for teacher) followed by an ordinal number, i.e. T1-T18 in the following chapter.

For clarification, the interviewees comments are distinguished from the rest of the text by having them in separate paragraphs, even those comments that are short. This is done to provide a better flow of the overall text and highlight the comments.

5.1.1 Phase 1:

5.1.1.1 Initial reactions

"I was very excited, but also a little insecure and frightened." vs. "Wow, are you kidding?"

In the first part of each interview teachers were asked to think back and review their initial reaction upon hearing about the purposed implementation. Many of the interviewees mentioned remembering that the discussion of the implementation first started following a promise made during elections in the municipality as one of the political parties in the running vowed, on national radio, that they would ensure tablets to all students of the municipality. That is, should they be a part of the town council following elections. However, communication channels between the town council and teachers seem to have been ineffective as many of the teachers described first hearing about the planned implementation from sources outside of their working environment. Some heard about it through rumors or gossip or even via acquaintances that had connections to members of the town council.

As in other parts of the interviews differing thoughts and opinions were expressed to this question, ranging from feelings of immense possibility to anxiety. Various teachers described feeling a certain reservation when they first heard about the plans to equip students and teachers with iPads while others saw it as an opportunity from the get-go, albeit those feelings were more common among the group of teachers that began work in Kópavogur after the implementation process had already begun. Many of the teachers expressed an initial reaction of excitement mixed with uncertainty and insecurity:

> "I was very excited, but also a little insecure and frightened. It was not something I was familiar with. I had never owned an iPad and I was not technologically savvy." (T17)

Others were not as positive, like for instance T7 who stated:

> "I felt it was a bit much, my reaction was "wow, are you kidding?" (T7)

T16 was not overly eager upon describing the initial reactions:

> "I imagine I was not jumping with joy. I do not remember when I first heard about this, I do remember we were told that we were expected to use the devices in our teaching. I thought about it a lot." (T16)

Other teachers were not as insecure as evident in the reply of T13:

> "I heard about it at least a year before, possibly two years. The news had spread to some of the teachers, especially to those with connections with the town council. I thought it was a sensible development, nothing unusual about it." (T13)

The interviewees descriptions of the decision-making process illustrated clearly that the teachers were not involved in the decision to proceed with the change in their working environment. The decision came from "above" and teachers were not active participators in the initial process, thus not feeling strong sense of ownership in the procedure. Hence, it can be argued that the decision was made prior to analyzing the different stages teachers could be categorized into as suggested in the framework developed by Donnelly, McGrarr and O´Reilly and therefore the teachers would fall under the categories of being contented traditionalists or inadvertent users of the iPads. In some cases, arguably, they could also be considered to fall under the category of being selective adopters.

5.1.1.2 Foreseen potential opportunities and expected obstacles

"The opportunities seemed almost endless to me." vs. "I was introduced to some apps but it was like Chinese to me."

When asked if they had foreseen possible opportunities upon first hearing about the implementation the majority of the teachers described feelings of positivity. Generally speaking the teachers seemed to have been excited about the possibilities embedded in the iPads, and foresaw, for the most part, a lot of potential in utilizing the iPads in their classrooms. The expectations often seemed in line with the previously mentioned ideas of Tapscott and Prensky, that is to say positive and needed in the environment of today.

The most commonly mentioned aspect was that tablets could help to diversify teaching and aid in the handing in of assignments. The possibilities regarding students with special needs (e.g. dyslexia) were often brought up as well, such as the chance to hand out recorded oral or visual instructions. Increased and constant access to information was also mentioned as appealing. Some teachers spoke of benefits of decreasing student trips to libraries for data gathering and the time pupils had to wait for physical copies of dictionaries. The built-in possibilities of the devices were also mentioned often:

> "In my classroom I use speech a lot. It is important when teaching languages to be able to use microphones and record one´s voice. I was looking forward to that possibility. I saw it as a fantastic addition." (T17)

Another interviewee, T6 further stated the following:

> "As a teacher I foresaw that students could hand in assignments, interactive assignments. A greater diversity in our methods, ways to do things and ways to hand assignments in. I foresaw the advantages of teachers receiving material from the students through the channels made available by the devices. I imagined that it would make organization much better and more efficient." (T6)

Most of the respondents described having been eager to start using the devices upon hearing about the implementation. As T9´s answer indicates some even believed the tablets to be a resource to open up physical barriers of the classroom:

> "I thought that the advantages were obvious. I teach social sciences and geography to teenagers. I have always thought, when I am teaching about Asia or South America, that it is a shame that I have never been there. But using these devices one can almost travel there. The opportunities seemed almost endless to me. Even though I did not really know how to take advantage of the technology I foresaw that the devices would make teaching much more fun and exciting." (T9)

When inquired about expected obstacles five out of nineteen teachers claimed not to have foreseen any obstacles, making it the most common answer to the question. The fear of losing control came up second, as teachers described that they feared that the iPads would make it difficult for students to focus on their work. Some of the teachers talked about foreseeing addiction behavior among their students, that students would be absorbed in gaming and that getting pupils to view the device as a tool rather than a toy could be problematic, or as T13 stated:

> "I foresaw what has since been happening, the 24/7 problem, the addiction. I remember thinking that we are already dealing with so much stimuli through the phones. But we could always ask the students to put their phones away." (T13)

Being afraid of using ICT is not uncommon among educators and studies have shown that some educators find technical education to be "overwhelming compared to more traditional forms of education." (Venezky, 2007). Indeed, there were also those, among the teachers, that claimed that they had seen their own technological illiteracy as a hinder. As T16 phrased it:

> "The biggest obstacle was that I did not know how to operate the iPad. I was introduced to some apps but it was like Chinese to me. This was just poured over us teachers, I just didn´t know what to do." (T16)

Even though many of the teachers foresaw possibilities and positive aspects involved in the implementation it was evident, in the answers given, that teachers felt that the process would add to their already excessive workload as many of them had to familiarize themselves with technology that they knew little about. This notion goes in line with the idea of technological knowledge, embedded in the TPACK framework introduced by Mishra and Koehler (2006), that new technologies have, or have the potential to change the nature of the classroom and that knowledge of technology is becoming an aspect if importance in the overall knowledge of teachers. It is interesting that the majority of the teachers described how they saw possibilities in potential use of the devices and had a positive outlook towards using them in their teaching, even those that were skeptical about the implementation. Those findings strengthen the notion that the teachers were not opposed to the changes imposed, but rather being left out of decision making processes.

5.1.1.3 Receiving the devices

"We got incredibly great lectures and there were meetings." vs. "We were just handed those devices and were expected to start using them right away."

The interview now shifted to the time when the tablets were handed out to the teachers. The iPads were handed out during the last days of the schoolyear 2014-2015, right before the teachers went on summer vacation, in accordance with a prior agreement in the town council. However, concrete news had not been passed on to teachers, albeit, as described in the previous chapter, news of the looming implementation had started to spread among teachers in Kópavogur in the fall of 2014. This caused uncertainty among the teachers since none of them had received information as to the extent and exact time of the proposed implementation. Mr. Gunnlaugsson was hired as an operational manager on April 1st 2015 and the three consultants in May that same year. (Gunnlaugsson, Interview with the implementation team, 2018) The municipality, or rather the town council, invited the teachers to a ceremony in Harpa, a concert and congress hall in Reykjavík, a neighboring city, to celebrate the implementation on the last day of the schoolyear. There were speeches and lectures given and among the presenters was the mayor of Kópavogur, Ármann Kr. Ólafsson. This gathering marked the end of the schoolyear and teachers started their vacation that afternoon. (Gunnlaugsson, Interview with

the implementation team , 2018) By June 2015 the iPads had been handed out to teachers, whom were tasked with learning how to operate the devices during their vacation. Importantly, the employment contracts of teachers, in Iceland, states that teachers should dedicate two weeks of their summer vacation to their training and, thus, it was justified that they would use a part of their vacation time to prepare for the following schoolyear. That summer introductory courses on tablets, open houses and seminars on ICTs were offered to all teachers of the municipality. (Gunnlaugsson, Interview with the implementation team, 2018)

The teachers were asked to review the time when the devices were handed out, and the support they received in the early stages of the implementation. Upon describing their experiences, it was evident that teachers´ emotions and experiences varied greatly, as was observable from the answers. Some of the teachers described feeling that they were under a lot of pressure, frustration and irritation whilst others expressed their excitement and praised support they received. The replies were very diverse:

> "I experienced a lot of pressure. We were just handed those devices and were expected to start using them right away. We were specifically told not to shelf them (the iPads) and bring them out every now and then. We were expected to use them a lot. Maybe too much. I used the iPad extensively that first year…" (T9)

T9 said when describing the initial experience, whereas T3 stated:

> "We got incredibly great lectures and there were meetings. There was a Facebook page dedicated to the implementation for the teachers in the municipality where we could get information and ask questions. It has been increasing ever since (…) I remember that we were told to use the iPads, try them and figure them out, develop skills." (T3)

A common notion, shared among many of the teachers, was the feeling of intimidation upon being handed the iPads and told to start experimenting and preparing themselves for the digitalization of the classroom the following autumn. In the words of T4, T11 and T13: "the responsibility was dumped on the teachers", with the "massive workload" that came with it. One interviewee, T18, was specifically displeased:

> "We were informed that the teaching methods were expected to change. It would be better for us, backed up by a research from Denmark. We just received the iPads and were told to start using them. There were courses in July and August and then we were expected to begin. There were loads of courses, but this is such a huge step, to take up using tablets in a whole municipality, it is just crazy. Total insanity in my opinion." (T18)

The better part of the interviewees mentioned receiving emails informing them about the handing out of iPads and being offered to attend introductory meetings with lectures about different apps and ways in which to utilize the devices during the summer. T4 describes "*infinite meetings*", whilst others refer to the number of meetings as "*a few*". T15 stated, on the same matter:

> "In the beginning there were introductory meetings and seminars and people could choose from all sorts of different things to learn about. It was a bit overwhelming for some, some people were hesitant and did not go "all in", but those who did, they are still "all in". Those that were reluctant back then still are." (T15)

During the summer vacation there were also open house sessions on Friday mornings in July in Snjallheimar, the headquarters of the team in charge of the implementation. In these open houses teachers could come together, seek assistance and talk about the implementation with the team. According to the implementation team, on average 30 teachers seized the opportunity. (Gunnlaugsson, Interview with the implementation team, 2018)

Upon returning to work from their summer vacations teachers were expected to attend lectures and seminars in order to deepen their understanding of the iPads, learn how to operate the devices and they were additionally introduced to some apps that could be utilized during their classes. Emphasis was placed on the implementation and introductory meetings continued during the fall of 2015. Furthermore, teachers were encouraged to arrange meetings with the implementation team and take advantage of their presence in the schools. The implementation team also had visiting hours at the schools during which teachers were encouraged to approach them and even get the team to attend their classes to speak to the students and introduce various apps and educational material related to the iPads. However, according to some teachers´ descriptions, the implementation team was still figuring out what was best suitable in the early stages. Or as T13 describes:

> "Teachers were expected to use two weeks during their summer vacation to work, to prepare. Most people did that. It was a tough, a lot was dumped on us. There were introductions to so many apps, and we were told to "try this and try that", the team had no clear vision and had not come to a conclusion. It was too much." (T13)

The bulk of the teachers answered that a lot of the support during the process came from other teachers and that peer encouragement and education was common. Teachers that were advanced in using the devices seem to have been eager to help others and that was an arrangement that had proven to be very helpful. It was clear that teachers felt that it was easier to go their colleagues in order to seek support than to approach the team in charge of the implementation. Teachers praised other teachers for their inspiration, their technological know-how and it and it was evident that the teachers sought strength and comfort in their peers and fellow workers. "We had peer education, where people came and spoke about what they were doing, that was helpful." T11 claimed, and later continued: "That worked best for us, peer education." T6 made the following remark, speaking about colleagues helping each other:

> "Some teachers are really passionate, and they are usually willing to help…There are two teachers here, within our school, that have been specializing in this fields and I go to them (for help). People help each other out…Co-workers helped each other. My feeling is that we stuck together. We were united." (T6)

T14 had this to say about peer support:

> "We speak about what has been successful and share our stories with each other. There was a lot of encouragement from those in charge, but also from teacher to teacher and that was inspiring." (T14)

Even one teacher, T9, that due to a busy schedule has not been able to partake in the peer education meetings had this to say:

> "There are times where there is peer education, but that always takes place when I am teaching, so have never made it, but I think that is a very clever approach." (T9)

In summary, the majority of teachers agreed that there was ample support from the team leading the implementation, as well as their superiors and co-workers. However, some mentioned that the support and encouragement sometimes needed to be sought after, that is to say, that teachers needed to look for the support, and to some of the interviewees that was an obstacle. One teacher, T1, was especially earnest when stating:

> "I imagine my experience was somewhat caused by my own insecurity. In the beginning I experienced the process to be threatening. I felt as if I was being told: "either you use the iPad, or you quit!". I had no choice, there were no alternatives. Also, I felt that the message was that we had not been doing anything up until the point when the decision was made. (To incorporate the iPads into the teaching methods). I feel that this was, in a way, due to my own insecurity, but I know that other teachers felt the same way. We were just put up against a wall and, something put into our hands that I had nothing to say about. But my encouragement came from within the school…We had a consultant here for some hours every week, that did not really help. Maybe I was as much to blame as the consultant." (T1)

The implementation was introduced as a way to help teachers organize and offer more creativity in the classroom. Most of the teachers agreed and illustrated, in their responses, that the revolutionizing of teaching methods in the municipality was emphasized during the implementation. There was a strong focus on the fact that the professional environment, into which the students would enter later in their lives, was changing drastically and how important it was to prepare the students for that ever-changing environment by emphasizing digital literacy. There was also a focus on the opportunities to make the teaching more diverse, individual orientated and personalized. At the same time, it was evident, from the responses that teachers were not expected to get rid of books and that the devices should not take over the classroom, rather to be used as an extension, as a new tool in the teachers´ toolbox, so to speak. The answers paint the picture that the implementation was supposed to change the working environment of both the teachers and students:

> "It was introduced as a revolution or a breakthrough. At least that we should use the devices to change the ways in which we taught. But we were always informed that it should not take over our teaching, but rather be introduced in steps. We were just expected to take advantage of the technology." (T17)

Was the reflection of T17, agreed on by T16:

> "This was supposed to be a revolution. The technology was supposed to revolutionize the way we taught. The studies were expected to be more creative and more pointed towards the individual student. The teachers were not expected to have the center stage, the students should be in the spotlight." (T16)

As mentioned, Firmin and Genesi described that educators tend to be traditionalists, meaning that they are not eager to latch on to the newest and latest technological advancements. (Firmin & Genesi , 2013) Even with the urgency of "not leaving the students behind" there has to be

an emphasis on communicating and making sure that every teacher is "on board" and involved in the procedure in order for the implementation to go as planned. This illustrates even further the necessity to introduce to teachers the potentials and possibilities that the devices come equipped with, rather than making the reluctant ones, among the teachers, feel even more reluctant in "pushing them up against the wall" as one of the interviewees described. As Fullan stated: "successful projects always include elements of both pressure and support. Pressure without support leads to resistance and alienation; support without pressure leads to drift or waste of resources." (Fullan, 2001, p. 92) The descriptions given by teachers indicate that they felt more pressure than support, even though support was to be found. It was tangible, in the responses that the teachers did not feel a strong sense of ownership regarding the implementation, rather they felt that they "had to" adapt and start working with the devices. The emphasis on teachers receiving help from other teachers was strong, and according the Fullan that is a good sign, as he deems it essential that communications and frequent and support is mutual. In Fullan´s view significant educational changes can only happen through a process of personal development that takes place in a social context. (Fullan, 2001) According to Mishra and Koehler, and their TPACK framework, a part of the problem in embedding technology with the everyday work tasks of teachers has been the tendency to focus on the technology and not how the technology is supposed to used, a focus on the material and not the method. The authors claim that introducing new technology into educational process is not enough, rather the primary focus should be on research on how the technology is utilized. Here it is also interesting to look into the claim made by Monstad (2018) that tensions are unavoidable and present in organizations, emphasizing that may lead to a deeper understanding of a given phenomenon. Thus, tensions during a change process might lead to positive results.

5.1.2 Phase 2:

5.1.2.1 Reflections on the implementation

"I was a part of the team from the beginning." vs. "I did not have a voice in the matter."

When it came to the question whether the teachers felt that they had a voice in the implementation, that is to say, if they felt that their opinions, feelings and points of view had been taken into consideration during the implementation the replies were diverse. Analyzing the answers gave clues that those, among the teachers, that were initially positive, or even passionate, about the implementation were given assignments, such as being "leaders" within

their schools, or made part of the "in-house team", which then resulted in those same teachers being more involved in the procedure of the implementation. Those positive were thus, "rewarded" for their positive outlook and mentality, whilst those less passionate were "left behind" or as T15 expressed:

> "Without a doubt (had a say in the matter). That was my experience. I was positive and excited, so I was chosen and made a leader for the team at our school. I clearly had a voice." (T15)

T11 had a similar experience of inclusion:

> "I was a part of the team from the beginning…We made a choice that the teachers could not decide whether or not they wanted to be a part of the innovation. Everyone was expected to be on board. Many people experienced that they could not, given their technological limitations. We decided that there would be baby steps, people were expected to set goals for themselves. They did not have to be big. Just start using the iPads for particular assignments." (T11)

Most of the teachers described that criticism was not appreciated during the early days of the implementation. Those that were more skeptical about the devices and their benefits in the classroom invariably agreed that their opinions had not been paid any attention to or as T1 stated: "Nobody asked us about our opinion" and then continued:

> "We were trying to describe (to the consultants) our experience from the floor, how things had been going since our students received the iPads. I remember the consultant crossed his arms across his chest and got really defensive. He did not listen. He chose not to listen." (T1)

T4, answered the same question simply: "No! Without any doubt or hesitation." T18 was also frank and to-the-point upon answering the question:

> "No. It is incredible that this decision was made without collaborating with the staff and teachers. People that do not have the slightest idea about teaching making decisions like this one. Deciding this. It is remarkable. This is one hell of a change in our working environment, incredibly big. It is utterly unfathomable that this decision was made by politicians. The stereotypical teacher is a 55 years old woman. That same 55 years old women would not have made this choice. I did not have a voice in the matter. We were expected to start using the devices, take a course and start. Of course, that course was during our summer vacation. It was poorly planned. Individuals had nothing to say in the matter." (T18)

Another teacher described the frustration experienced as:

> "Sometimes I wanted to pull out my own hair." (T17)

In summary, those teachers that have spent their time adjusting to the changes and learned how to utilize the iPads in their classrooms are those teachers that feel that their opinions have had weight, as opposed to the teachers that spend less time learning how to utilize the devices. Arguably, it could be stated that the communicational aspect of the implementation has left out those teachers that were not on-board from the get-go.

5.1.2.2 Three years in

"This, of course, is the future." vs. "They use the tablets too much."

The teachers were asked if they could further reflect on the implementation and the time that has now passed and try to narrow down the most positive and negative aspects of the implementation.

The teachers could all name positive things but what was considered the most positive element varied greatly. The variety of assignments and the diversity in the ways that assignments could be handed in was often brought up as well as the possibility to tackle assignments in different ways and shape them to individual needs and preferences. The access to information was also celebrated among the teachers, the fact that students have "all the libraries in the world" on their devices, as T18 stated, and that "the students have the world in the palm of their hands" in the words of T9. The potential to organize the studies independently and to hand in assignments in a creative, original manner was also put forth, or as T7 put it:

> "The methods of teaching are changing, and it is in accordance with the curriculum. There are not just the answers written down on a piece of paper. This has helped us to become more creative and to organize things, the assignments, everything." (T7)

T9 claimed that individuals in the teaching profession could not but celebrate these opportunities:

> "To borrow virtual reality glasses and you are in the middle of the jungle, in the midst of Africa. It is a game-changer." (T9)

Another teacher, T2, claimed that "Google is everybody´s best friend now" adding that anything could be found and that everything had been made possible. The variety of teaching material, and access to it, was considered amazing by some. The possibility to have many ways to introduce a single concept was mentioned by T6. In addition to being liberated from "endless stacks of paper", photocopies and books. T5 went so far as to proclaim:

> "This, of course, is the future. This is what is to come. They (the students) need to learn how to take advantage of the technology and how to use it wisely. We get to help them understand what is age-appropriate and what is not. What is good on the Internet and what is not. To teach them that you should not believe everything that you see on the Internet." (T5)

That is, indeed, one of the purposes of the implementation, to teach students about "digital citizenship", how to behave on the Internet, what is appropriate and what is not. Teachers acknowledged that aspect and some claimed that the devices helped them prepare their students for the ever more digital world. The fact that the iPads come with a microphone and camera was also named and editing tools were considered to be good tools for those students with disadvantages such as dyslexia. Teachers further mentioned that they could now give verbal instructions and present content visually.

As described by Prensky (2001) the changes in education, with the arrival of digital technology at the end of the 20th century, might be called a "singularity" that has led to changes of such magnitude that there is "*absolutely no going back."* (Prensky, 2001, p. 1) If, as one of the interviewees (T5) put it, "this is the future" it seems very important to embrace and to celebrate the changes in the environment of the students, and that the teachers need to adapt to those same changes, embrace them, prepare and study the changing landscapes. Or, in the words of Henry Jenkins:

> "If the educators do not study the changing media landscape, they are in no position to help students navigate its twisty pathways." (Jenkins, 2008, p. 16)

When asked to consider what had proven to be negative consequence of the implementation of iPads in the classroom, the lack of attention was brought up often. The iPads, according to many of the teachers, are the cause of constant stimuli and temptations to play games in class or to use the iPads in other, non-educational ways thereby causing students to lose their attention and focus. Addictive behavior was mentioned as being the biggest problem by a big part of the teachers, albeit most of them acknowledged that this was not a big problem for the majority of the students. Nonetheless, to a minority of the children and teenagers this was a real problem. Teachers described frenzied children, crying and screaming, even showing violent tendencies when asked to shelf the iPads or put them into their backpacks. The addiction like behavior was described in great detail by some of my interviewees. The so-called "screen-time" was mentioned by teachers as well, some stating that the innovation had caused students to spend less and less time socially interacting.

> "They use the tablets too much, I think it is sad to watch them in the class, in the hallways of the school, they are all just sitting there playing games." (T4)

The realities described by teachers were those of students losing their concentration and train of thought, finding it difficult to focus on the tasks at hand. That goes hand in hand with the ideas described in theories about "informal education" and "informal learning", where the teachers are often threatened by the "loose atmosphere" associated with informal learning.

5.1.2.3 Words of advice and pitfalls to avoid

"It does not work that way, we all see that now."

Teachers were asked, hypothetically, if they could send a message back in time, to the implementers and give them words of advice – what that advice would be. The most common answer was that teachers would have chosen to keep the iPads at school rather than sending the iPads home or as T16 claimed:

> "I would have liked for the iPads to be kept at school, just as sets for each class. That they would have been kept in the shelves, just like the books…But then they got to take them (the iPads) home and there the devices just become toys." (T16)

The main arguments mentioned were that the students, especially the younger ones, are not ready to deal with the temptations of having these devices within reach at all times and that the iPads tend to cause an imbalance in the households of the students.

> "What happens in the homes is not the schools´ problem. But I have heard that some of the students are not getting enough sleep because they are on their devices at night." (T2)

The imbalance, in question, is caused by the encouragement to use the iPads and learn at their own pace, in the places that the students found most suitable for themselves. However, due to their young age the iPads, according to many of the respondents, are mostly used for non-educational activities at home, leaving the parents and guardians vulnerable since the students claim, and rightly so, that they are encouraged to spent time on the devices. Sending the iPads home also gave the notion, according to many of the teachers, that the iPad is a toy rather than an educational tool. In the mind of the students the device that they get to play with at home, remains just that in the classroom. A toy. Teachers also suggested that coordinated rules would have been appropriate, and some described that during the first weeks of the implementation they felt very powerless and not in control in their own classrooms. As T4 put it:

> "In the beginning there were no rules. It was just really open and free, and they (the students) were expected to be responsible, to know when to use the iPad and when not to. It does not work that way, we all see that now. Teachers knew, even back then, that it would not work, but this was the attitude. We were not supposed to be implementing or policing rules. That was the message from "above". We tried pointing this out, teachers complained but we were just really defenseless." (T4)

These words well describe a feeling common to many of the teachers. Teachers claimed that maintaining order and having rules to follow is a necessity in the classroom, and the idea that students would be able to guide themselves and be in total control was not realistic. As T11 indicated coordinated rules, as suggested by the teachers, would have improved the environment and made organization easier and more manageable. Having consequences for disruptive behavior and clearer rules for students, and teachers alike, on how to handle issues related to iPad use and misuse was also something that teachers mentioned as a necessity. T17

described that there was not much room for criticism and that is something that teachers would strongly advise the team behind the implementation to take into consideration. According to the teachers many of them had specifically asked for some sort of a system, or a tool, to have an overview of what the students were doing on their iPads during classes. Those request, were not given much consideration until much later in the procedure when teachers of younger students were introduced to Google Classroom and other monitoring systems that proved helpful. Eventually the teachers of the older students were granted permission to use the same monitoring systems in order to increase their control of what goes on in the classroom. Regarding the introduction of the iPads and the implementation process many teachers addressed that they would have liked for it to happen at a slower and more manageable pace, giving them longer time to adapt to the changes in their professional environment and for the team to have had a clearer picture of the process beforehand, emphasizing on certain apps and organizational material for instance, rather than having a "trial and error" mentality. One of the teachers reported that the teachers kept adapting to some systems or apps and then suddenly new things were introduced and expected to replace the existing ones. Such changes, according to the teacher, proved to be difficult and disheartening. Especially for the older teachers that were not very technologically orientated. In other words, the advice was for the team to have figured out which systems and apps were most suitable and appropriate before starting the procedure.

Also mentioned was the advantage of keeping the implementation procedure more individual based so that those technologically advanced did not have to sit through obligatory seminars and lectures about things that they were already familiar with and comfortable in using. Another piece of advice was for the technological infrastructure to be in place before the implementation procedure began, as it proved to be an annoyance and demoralizing to not be able to take advantages of the possibilities because of technological constraints such as not being able to connect the devices to projectors or even maintain a proper Internet connection. Encouragement to use the devices and not to fear technology were also mentioned as good advice to send back in time by T12 and T2, since teachers described having been reluctant and worried in the beginning but later in the process found that those worries were based on insecurity and the best way to overcome that was to start using the devices and thereby overcome that self-doubt.

Importantly, what is currently seen as an obstacle by teachers might indeed by the manifestation of the "growing pains" of digital technologies in education, or the

implementation dip as introduced by Fullan (2001). What is now a distraction, might, when the balance has been found, be considered a part of the educational procedures of the future. As Prensky (2001) stated: "*Today´s students are no longer the people that our education system was designed to teach*." (Prensky, 2001, p. 1)

By taking advantage of the possibilities found in ICTs, Loveless and Ellis (2001) argue that information and communication technology can afford opportunities to extend the connection between students and teachers and information beyond the "formal school day".

When the teachers were asked about what had proven to be the biggest pitfalls of the implementation two things were most frequently mentioned. First it was the addictive behavior that teachers had witnessed among their students and the second most mentioned aspect was the temptation for students to play games or get involved with social media:

> "The students can´t let go of their devices, they have become somewhat addicted to their iPads…It has been a rough path. The children are only 10 years old when they get the iPads. They just want to play with them all day long." (T3)

T7 agrees with that notion, as do T1, T17 and T16. Similarly, T12 said:

> "The children lose control and the devices take over. They keep playing games or get on Snapchat." (T12)

T8 further claimed that:

> "When we start class, they should not be playing on their iPads, but there are always some that do that." (T8)

The problem, described by the respondents seem not to be isolated to the classroom, or the homes. The hallways of the schools have also become a haven for students playing on their devices and T6 stated:

> "There should be an obligatory break from iPads during recess." (T6)

As mentioned, the teachers have since been equipped with a monitoring device and can now lock the iPads of individual students if they see that students are using the devices for things unrelated to the subject of the class. Getting such a monitoring device was something that teachers pushed to get in order to have better control in their classrooms. However, it has come with its share of problems as T14 describes:

> "We can now lock their iPads if they are doing something that they are not supposed to be doing. But some of the students become very aggressive when that happens. I have had students that tried breaking their iPads in order to get back online. They cry, and I have been threatened with violence." (T14)

Another teacher, T5 described emotional imbalance due to limitation of iPad usage:

> "Recently we asked our students to keep the iPads at school for some time, and it was almost like we were taking drugs from addicts, even though they knew it was just for a few days. They cried and became really upset…They were obviously not in control, when the iPad has such an effect on their lives that they cannot go home from school without losing control of themselves." (T5)

Finally, T5 concluded that since the implementation procedure protocol clearly states that the children should bring the devices home and that the teachers are not at liberty to stop them from doing so:

> "This creates an imbalance between the schools and homes. We cannot play the bad guy and remove their iPads, resulting in their anger." (T5)

Teachers described how some children were allowed to sign up to social media sites where the age restrictions are clear, even though they had not reached the age-limit. The same thing was described in relation to games, as some of the students were allowed to download and play games that were clearly inappropriate for their age, even advertised plainly as not recommended for people under certain ages. This was considered to be a pitfall by teachers T7, T2 and T15. When some children had access to such games and social media, and others had parents that followed the age restrictions it was clear cause of imbalance among the children according to those teachers that addressed it. Other negative side effects of the implementation mentioned were the negative effects on students´ reading. Or as T13 noted:

> "They read less. Some of them use the iPads for reading, but mostly English. Their vocabulary is decreasing." (T13)

Upon answering this question, it was made evident, again, that the teachers felt that they should have gotten more time to get acquainted with the iPads before using them as an educational tool. T9 described that it would have been suitable to get a whole winter where teachers would have gotten familiar with the devices and learned how to use them, emphasizing the need for more education among the educators. T11 noted that the process was too fast and that teachers would have appreciated a dialogue between members of their profession and those in charge of the implementation. Other issues that came up were in relation to socializing skills

among the students and bullying taking place online. T15 stated that the usage of social media among students had proven to facilitate bullying.

It might seem as a slippery slope, to hand the control more over to the students and let them be more responsible with their studies and their learning. As Firmin and Genesi (2013) stated:

> "One of the most critical issues is the extent to which teachers will relinquish control so that their students can drive their own learning. Encouraging students to use computers gives them power to access, manipulate, modify, store, and retrieve information which ultimately gives them more autonomy in the classroom" (Firmin & Genesi, 2013, p. 1609)

This shift can prove to be intimidating for teachers. The role of the teacher changes with these shifts and it is expected that such changes take time and adaption. Putting learners in the driving seat is a big step to take in the institutions of education, since the teachers have been in that exact seat for generations. When students are given more authority that impacts the classroom and the culture within it. Mishra and Koehler (2006) stated that new technologies had changed the nature of classrooms, or at least they had the potential to do so. The iPads, as described by the interviewees offer powerful means to introduce and illustrate new subject matters and offer new ways of representation. In order to make the most of the potential offered by technological gadgets Mishra and Koehler emphasize the importance of learning new skills and techniques instead of learning how to use currently available tools and gadgets, this they argue is important because of the rapid rate of evolution of digital technologies. To seek knowledge of technology, they argue, is becoming more and more important aspect of teacher knowledge.

5.1.2.4 Ongoing support for the teachers

"There is a lot of support." vs. "You mostly have to take care of yourself."

As studies have shown there is dire need to properly encourage teachers in the early stages of an implementation of new technologies. (Traxler, 2014) To assist teachers as they find a footing and familiarize themselves with new devices. (Mumtaz, 2006) Encouragement is a crucial element to ensure that the implementation takes off on the right foot and that teachers are comfortable with the changes in their environment. When asked about the support that teachers have received in those years since the implementation began and the support received now, three years in, teachers answered in a variety of ways and it is evident that personal preferences and experiences vary greatly. Some of the teachers claimed that there was still good support

from the implementation team, that they spent time visiting schools, hosting lectures and offering time to answer questions. T3 was one of the teachers that was quite positive upon describing the access to support and encouragement for teachers. T7 described similar experiences stating that the implementation team could always be reached by phone, email or through other lines of communication. However, there were teachers that described that communication with the implementation team was not good at all, or as T18 stated:

> "The consultants from "Snjallheimar" have been arrogant. Their message is that now teachers can, finally, be creative in their field. That finally they can offer variety in their classrooms They have made themselves somewhat unpopular among the teachers. The iPad is glorified too much in their communications. Now we can finally start to "really teach", but we, the teachers have a different opinion. In our opinion we have been teaching like they describe, for a long time." (T18)

The teacher continues and claims that some of the teachers have actually stopped paying attention to what the team has to say and do not want them entering the schools. Describing their relations with the teachers as "*clumsy*" and communication with the teachers as "*tasteless*".

Most of the teachers seem to be in agreement that they are expected to work independently and maverick in their work, but with the possibility to seek assistance when needed. A majority of the teachers seem to know through which channels support can be found, but the respondents descriptions verify that there is a differing culture between the schools. Some of the municipalities schools have a reliable "in-house" team of leaders that can assist teachers and point them in the right direction when needed whilst in other schools there does not appear to be an active team supporting the teachers. Three of the respondents, T11, T12 and T15 describe that in their experience things have been slowing down and that the implementation is "no longer a priority" and that the consultants are not really helpful. T11 noted:

> "I sense that our focus is somewhere else right now. The iPads are on "hold" and nobody is really paying attention to them right now. There is not a lot of support or encouragement to be found now." (T11)

The implementation team has continued to offer teachers assistance in form of days where they (the implementation team) would come and spend time in each school, offering courses, introductions, seminars, in-class visits and assistance. The majority of the teachers stated that those days were not working as well as they should or could. Teachers claimed that, given

their limited time, they had often made arrangements that stood in the way of them seizing the opportunity. As teacher T13 described:

> "We can´t take a lot of time from our teaching to figure things out. We have to be on top of our game. We would have liked for them (the implementation team) to be more in control, for them to take charge…I belong to the older generation of teachers, I am not really advanced. I would have liked more seminars." (T13)

It is safe to say, according to the interviewees that the experiences are personal and vary greatly. There was not an evident trend in answers regarding the support to be sufficient or to be insufficient, the answers spanned the spectrum of "there is a lot of support" and "we get good support" to "you mostly have to take care of yourself".

It was clear, in the responses given by the interviewees, that those that celebrated the iPads in the beginning continue to feel that the support is greater than those that opposed or were more withdrawn and/or reluctant. Even those most technological deterministic and positive among scholars, that have written about the matter, for example Prensky (2001), emphasize the importance of administrators supporting the teachers during technological implementations. Teachers have, both in the interviews conducted for this thesis and in other research, reported encountering several difficulties upon incorporating new technology into the classroom. Among the most common difficulties are lack of training, support and time. (Holden, Ozok, & Rada, 2008) It seems essential for an implementation of the magnitude as the one in Kópavogur, that teachers and their need for support is kept in mind. To make the most of the implementation it is evident that it is important to emphasize that "no man is left behind" and all teachers are kept in the loop, since it is noticeable, from the responses, that those among the teachers that feel that they have not been made part of the communicational practices feel left behind and have not made an effort to utilize the possibilities and potentials of the iPads in their classrooms. Teachers need, according to Mishra and Koehler (2006), to have knowledge that goes beyond content-, pedagogy, and technology knowledge if they are to be successful in teaching with technology. This knowledge, the authors call technological pedagogical content knowledge and affirm that is the basis of good teaching with technology and "requires an understanding of the representation of concepts using technologies; pedagogical techniques that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems students face; knowledge of the students prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge and to develop new

epistemologies or strengthen old ones. (Mishra and Koehler, 2006, p. 1028) In order to develop such skills and knowledge, it is evident that teachers need support. The standard approach to providing such support, according to Mishra and Koehler, is to assume that teachers need to be trained to use technology. The reality they belief is more complex, as learning how to use technology does not provide the necessary elements to teach with technology. They state that most scholars, in the area of educational development, agree that traditional methods of technology training for teachers are not the most suitable ways, namely workshops and courses, as they do not produce the deeper understanding that they deem crucial. For this conclusion they give a number reasons, including the rapid rate of changes within technology and the situated nature of learning. The authors suggest a different support approach. Their suggestion is that technology should be learned by design, where "*emphasis is placed on learning by doing, and less so on overt lecturing and traditional teaching.*" (Mishra and Koehler, 2006, p. 1040) This method, they argue, would embody a process that is already present in the construction of artifacts like digital videos and online courses.

5.1.2.5 Feedback

"The consultants have been very open-minded and willing to listen." vs. "I have not really felt that they have paid much attention to our answers."

The teachers were asked whether they experienced their feedback was sought after and appreciated by the implementation team. Furthermore, they were asked to assess if there were any formal channels for teachers to give feedback about the implementation process and some sort of a platform for discussions. Importantly, there are those, among the teachers, that claimed that there have been clear ways of providing feedback and that they are pleased with the way their concerns have been received. T1, for instance, complimented the implementation team for their open-mindedness and noted that they always came as soon as they were asked for help and that they are evidently learning from experience, both their own and the experiences of the teachers. T9 spoke about how easy it has been to approach the consultants and how willing they have been to listen and assist. However, the majority answered that formal channels for feedback were scarce:

> "There has not been opportunity for a lot of feedback. That would be a clever way to continue this process. To gather information about what has worked well and what has been most helpful in the process." (T2)

T10 further claimed that:

> "I don´t recall them asking specifically about what it is that we are doing, we have not been asked. I don´t recall that. They (the implementation team) have not sought after my opinion." (T10)

Similarly, T5 noted that:

> "They do not systematically approach us to inquire how things are going. I have never been asked, as a teacher, how I would have liked for this to be done" (T5)

Nonetheless, other teachers described that they had ways to get their opinions across, e.g. via emails, Facebook messages, telephone-calls and during meetings, albeit their views were not always well received. As T13 put it:

> "There is a Facebook page and then we have their emails, but, in my experience if we raise critical voices they (the implementation team) get defensive." (T13)

T14 claimed that the team tries to find out what teachers are doing and how things are going and recalls answering a survey about the process but adds:

> "I have not really felt that they have paid much attention to our answers." (T14)

An interesting aspect of the interviews was that some of the teachers describe surveys that have been sent out whilst others specifically speak about no surveys ever having been distributed among the teachers. Overall, it seems evident that teachers long for platforms where their voices, opinions and experiences on the implementation have weight. Again, it was clear that those, among the teachers, that felt that their feedback had been taken into consideration were those that had been more positive and had spent more time familiarizing themselves with the devices. Those more hesitant and cautious described their experience, that their feedback had not had an impact and, even, not been taken into consideration. This goes hand in hand with the ideas introduced by Fullan (2001) where he addresses that teachers that develop a say in decision making processes often begin experimenting with new roles. In the case of the implementation in Kópavogur it was found among those more passionate in regards of the process. Those teachers often started taking a more initiative and exchanged ideas. They were given more authority.

5.1.2.6 The impact on learning and teaching

"There is more independence for the students." vs. "The younger students are not capable of seeking their own information."

The majority of the interviewees stated that the implementation had aided teachers in making studies more individual orientated. Furthermore, according to their replies, most of the teachers had changed their methods of teaching, most commonly with regards to differing ways of handing out and receiving student assignments, not least to aid students with special needs. T15 illustrates this in the following comment:

> "We have special teachers that are supposed to help students that are less advantaged, but now those students can stay in the room and study with their fellow classmates. They can work on all sorts of different assignments and no longer have to be running into walls. They might choose to draw their solutions, record their voice, make tags or do whatever they prefer while studying. There is nobody pointing out to them that their grammar is not perfect. Their strengths can be found through other channels." (T15)

Importantly, teachers have also seen the implementation as a chance to aid advanced students lacking extra stimuli by providing more challenging assignments. As T17 framed it:

> "Without a doubt (it has made teaching more individual orientated), if a certain student has difficulties working on any given assignment we can always find something more appropriate. All students can work on individual assignments and those that are more advanced and need more challenging material can get that." (T17)

T18 agreed with that comment, stating that:

> "There is more independence for the students. For the more advanced students it helps, for those that can handle it. We put the curriculum onto their devices and they can march on and work on their tasks. If they are hard-working it can be of help and make their studies more individual orientated." (T18)

Of note, teachers that taught older students were more positive regarding the individualization reached by utilizing the possibilities brought forth by the iPads. However, teachers with younger pupils were more ambiguous in their views, or T5 stated:

> "The younger students are not capable of seeking their own information to the same extent as the older ones." (T5)

The interviewees´ answers indicated that those teachers that had actively begun utilizing the iPads in their classrooms and offered students different methods of learning were more likely

to answer that the implementation had made a positive impact. Other teachers expressed certain doubt in regards to increased individualization and benefits to students:

> "Students can now take advantage of audio-books, but that possibility had already been made possible by utilizing cd-players." (T13)

T13 continued and stated that in his/her classroom students were not offered the chance to work on assignments in a variety of ways. The same was stated by T16:

> "We have not been letting them record audio or video instead of doing traditional assignments even thought that could really help those less advantaged." (T16)

Notably, those teachers that were most positive in their views to the implementation from the get-go seem to have been likelier to offer their students a variety of ways of learning. Thus, it can be argued that they have thereby facilitated student´s climb to the "driver´s seat" of their own learning, in line with the ideas Tapscott (2009) and Prensky (2001). Some of the answers illustrated an empowerment process among students. That students had a more active part in their education. That students were given opportunities to choose between methods whilst working on their assignments, have a better grasp of what was expected of them and so forth. Whilst empowerment is usually referred to as a process that takes place among individuals or groups and interaction with the environment it could also be argued that ideas could be empowered. The TPACK Framework for instance, could be seen as a mean to empower education, to increase the ability of education to perform in regards of reaching its goals. Education can, arguably, be elevated or even motivated through empowerment. Technology could, then, also be considered to act as an empowering tool in education. The usage of iPads in Kópavogur, has according to some of the teachers elevated education and educational approaches and increased job satisfaction among teachers and students alike. Increased job satisfaction is a known by-product of empowerment. (Edwards et al., 2002) It was evident that those teachers that had been positive from the early stages of the implementation were more likely to experiment with the iPads as creative educational tools in their classrooms. They proved more likely to allow the students to experiment with different means of working on and handing in assignments than those more reluctant or hesitant in the beginning.

5.1.3 Phase 3:

5.1.3.1 From "sage on the stage" to "guide on the side"

"We are not quite there yet" vs. "The student has such a big advantage on the teacher"

The teachers, in Kópavogur, were asked whether they experienced a shift towards more constructivist teaching methods following the iPad implementation. Almost unanimously the teachers agreed that steps were being taken into the direction of making the roles of teachers more in line with being guides for students seeking their own knowledge. T16 commented:

> "We are not quite there yet, but we are getting there. This is an ongoing assignment and at the end of this road we want to be completely student orientated and on the side as guides. We might be close to being halfway there. We are trying to get there." (T16)

Another teacher, T6, had a similar story, stating:

> "I can walk among the students and assist them, of course that is what you do as a teacher. You walk around to make sure that students are on the right path. There are always those teachers that prefer the more traditional ways of teaching, but I do not think that that is common these days." (T6)

As did, T12 who claimed to have never experienced his/her work to teach students facts but, rather, it was the job of the teacher to teach students to come to their own conclusions and ways of figuring things out:

> "I want to give them tools to access information and strengthen them as students. Help them grow stronger and to bloom." (T12)

T15, T3 and T11 described a similar point of view. T11 claimed that teachers are on their way there, albeit the goal is still a way off.

Many of the interviewees claimed that there was a mixture of traditional teaching and more constructivist line of teaching. Teachers still had lectures, from their teachers-table or the whiteboard, in front of the class but after the introduction of the subject or material the students had increased freedom to gather their own information and choose ways to present their findings and hand them in. T1 described himself/herself as working with a mixture of a conductive and transmittal teaching model:

> "There are some elements that need to be there, some foundation. We need to teach the students how to access information and it is obvious to me that there is no need for them to know all information by heart. Information such as the length of some specific river. That is over and done, fortunately. I want the students to enter life with the abilities and tools to access what they need and to gather what is true and real." (T1)

T14 also describes how the students got a short lecture in the beginning of the class and then received guidance in ways to assemble further information. The same procedure was described by T2 who stated:

> "Things have been changing drastically. A teacher always needs to have lectures and instructions but often a teacher is also in the role of a guide…with the implementation came the opportunity to divide the classes into groups, according to their skill levels, and then allow for them to work more independently and focus on helping those that need more teacher assistance." (T2)

An aspect, brought forth by T11, was the importance of teaching students to be critical in their evaluation of information:

> "We actively encourage students to seek their own information. To "Google things". We are getting there. But we also need to teach them to be critical and read into the information that they gather. They have access to all sorts of information and some information sources are more correct than others." (T11)

The interviewees were asked whether they considered the fear of making mistakes an obstacle that had hindered them in utilizing the iPads in their classrooms. More than a half of the teachers agreed with that notion and claimed that, initially, they had been reluctant to take advantage of the devices due to their fear of using them. T11 stated:

> "Of course, I relate to that. This is something that I hear from my co-workers all the time…I would like to try, but I am afraid to because I am not willing to mess things up. This keeps me from doing things sometimes." (T11)

T18 spoke openly about the imbalance between the teacher´s and student´s knowledge of ICTs:

> "There the student has such a big advantage on the teacher. In the blink of an eye everything changed. The teacher was no longer the all-knowing authority. The authority was shifted towards the students, which is fine. The teachers are not supposed to be Mr. or Mrs. "Know it all" pouring knowledge over their students. But there was an imbalance born there." (T18)

Other teachers acknowledged that it was difficult to "step out of the comfort zone" as T16 framed it:

> "I will admit, without hesitation, that I had no idea what I was going to do with this device." (T16)

T15 admitted to having been afraid in the beginning and stated that those teachers that still are hesitant towards the iPads are so because they fear making mistakes:

> "They are uncertain. They think that they have to be really good at operating the iPads in order for the students to be able to use them." (T15)

Interestingly, many of the teachers described the unease towards their colleagues' views on their performance:

> "This is something that a lot of my co-workers relate to, there are many teachers here that do not like to do things until they know how to do them 100%, it is a character trait." (T12)

T9 had a similar response to the question:

> "Many teachers need to feel that they are in control, and I am not criticizing that. The iPads disrupted that. That is why many of the teachers shelfed the iPads." (T9)

T14 had the same idea:

> "I think that a lot of the older teachers fear using the devices because they fear making mistakes." (T14)

Lastly, T4 commented:

> "I feel it among my fellow teachers. I think that a lot of teachers need to feel that they are in control and on top of things. I think that is the stereotypical teacher. The teacher is not supposed to make mistakes" (T4)

Many of the teachers concluded that eventually they came to terms with the new reality, and even embraced the fact that the students were more advanced than they were. The majority of

the teachers even mentioned taking advantage of the students´ skills by having the students help them out with technological matters. T16, for instance, plainly stated:

> "The students are much better than I am. It does not affect me admit that. I do not feel that I need to be ahead of them. It is them teaching me." (T16)

T5 had a similar response:

> "They, (the students), are much more skilled than I am and less afraid." (T5)

For students to be more in charge of their studies, to be more involved and active as participants in their knowledge seeking during school hours would, eventually, prove to be an empowering process.

5.1.3.2 Digital citizenship

A digital citizen is an individual that uses the Internet regularly and effectively to engage in societal affairs, such as government and politics. (Mossenberger, Tolbert, & McNeal, 2007) Digital citizenship and the ability to participate in the online society is an important 21st century skillset. It is now considered an important part of educating children and adolescents to increase civic engagement. (Jones & Mitchell, 2016) The focus on digital citizenship in education is also encouraged to help young people build and practice specific online social skills that may in turn counter problematic behavior such as cyberbullying and sexting. (Jones & Mitchell, 2016)

To ensure that students are competent in their navigations that are made possible through the means of digital media and the Internet, teachers have a responsibility as pointed out in the words of McQuiggan et al.:

> "Instead of fighting the inevitable and infinite battle of restricting use, educators should leverage students desire to use mobile devices and introduce students to tools and strategies for making learning more efficient and effective. Teaching digital citizenship will ultimately lead to smarter use of technology and fewer security issues as students internalize the principles for what is appropriate to share and how to make those decisions independently." (McQuiggan, Kosturko, McQuiggan & Sabourin, 2015, p. 319)

When the teachers were asked if, during the implementation and to date, there had been an emphasis on digital citizenship they were not in agreement. Most acknowledged that digital citizenship was a concept that was often brought up, but many claimed that matters could, and

should, be handled in a more systematic manner. T7, for instance, stated that there had been obligatory meetings on digital citizenship for both students and teachers, as well as information sheets and slideshows sent to every individual teacher in the municipality to open up discussions and educate the students about digital citizenship and appropriate behavior online.

> "We have been talking about it (online behavior) a lot at school. We talk about uploading images and texts online and if something inappropriate comes up we deal with it. We use certain classes for that." (T7)

Responsibility came up in some interviews as an increasingly important aspect:

> "There is more responsibility now that we hand them the devices. The municipality forced the iPads upon them and we have a responsibility." (T13)

Of note, it has not been made clear who should accept the ultimate responsibility for guaranteeing responsible online behavior among the students:

> "The parents feel that it (responsible online behavior) should be the schools´ responsibility and vice versa. I think that the teachers should not expect students to get that education from home." (T6)

5.1.3.3 Reflections on a digital future

According to Holden, Ozok and Rada:

> "Teachers can see the benefit of using technology to promoting students learning experiences; however, the advantage of technology in improving lessons encountered a more neutral perception. Time, training, and perception constraints and limitations significantly contribute to these results. To some, technology can be more of a nuisance than a helper." (Holden, Ozok, & Rada, 2008, p. 114)

The teachers were asked if, hypothetically, they would like to put aside the iPads and start teaching without them again. Of note, T11 and T3 stated that they personally knew that some of their co-workers would celebrate the idea of returning to teaching without tablets. However, all of the eighteen teachers interviewed denied wanting to retire the tablets from teaching, albeit their arguments differed. As T2 phrased it:

> "Never. There are so many possibilities involved in with the iPads. Not only the teaching, but also all the organization. Gathering of information, making lists, taking names, dividing students into groups. To get all information sent to this same device. I take pictures to remind me, take screenshots, I then make folders and have all my information in the right place." (T2)

Indeed, T4 stated that teaching in an environment without iPads had now become an impossibility. T6 and T15 agreed and added that they felt sorry for teachers that taught in environments without iPads since it was "limited and boring". T17 argued that the iPads brought more fun and diverse possibilities of studying to the classroom. T16 stated that the iPads had become such a big part of teaching and learning that it would not be wise to turn back to teaching without them.

5.2 Interview with the Implementation Team

The interview with the implementation team followed the interview guideline mentioned in the preceding chapter. As previously explained the implementation team consisted of one project manager and three consultants. When the interview was conducted, in early March 2018, one of the consultants, I4, was absent and was therefore not a part of the discussions. In addition to seeking answers according to the aforementioned guidelines the team´s views on answers provided by teacher´s in previous interviews was sought after.

5.2.1 Phase 1:

5.2.1.1 Initial reactions

According to the team, the implementation procedure was already in place when they were hired to supervise the assignment. As I2 put it:

> "We came on board when the boat was already in the middle of the river. The decision to launch this implementation had already been made, in a way which the municipality had planned to do things was already lined down. Even the equipment had been chosen." (I2)

The timeline was, according to I1:

Municipality elections, May 2014 - an agreement of affairs and an initial group assembled to formally start the implementation, summer of 2014 - formal project manager hired, April 2015 - three educational consultants were hired, and implementation team formally assembled,

May 2015 - the first iPads handed to the teachers, early June 2015 - use of iPads begun in classrooms in Kópavogur, August 2015

5.2.1.2 Foreseen possibilities and expected obstacles

When the team was asked about the possibilities that they had foreseen, before the implementation was officially launched, the answered varied somewhat. I3 stated that she/he had seen an opportunity to increase the enthusiasm of the students and better ways of organization. I1 claimed that, in his/her opinion, the empowerment of the students was the biggest possibility and what she/he actually considered the focus of the implementation:

> "To change the way that the schools operated in the municipality. To make sure that the students had much more to say about their own studies." (I1)

I1 further foresaw new possibilities and opportunities in the ways that students could approach their own studies:

> "More varieties and more choices. If they wanted to study during school hours, or at home, or during their summer vacation." (I1)

I1 claimed that she/he wanted students to have the opportunity to study on their own terms and concluded:

> "The possibilities to meet every individual student and their needs, the key to that can be found in the diversity of the iPad." (I1)

I2 had a more personal approach in his answer, as she/he claimed to have been deeply embedded in multimedia for some time, before joining the team. I2 stated that she/he had seen opportunities in multimedia, communicational ways that she/he believed that could change things. I2 told the researcher that she/he, herself/himself, was a parent to four children and that two of her/his children were not coping well with the traditional educational system:

> "I had sensed, both as a parent and as a teacher, that there was a dire need for things to change." (I2)

When asked if they had foreseen any obstacles the team agreed that they had feared that it would be difficult to get all the teachers on board with the implementation:

> "I was worried that it would prove difficult to take a municipality of this size and magnitude and get all the hundreds of teachers aboard, and to get the masses to set the sails in the same direction." (I1)

Indeed, according to the interviews conducted among the teachers, many of the teachers described not having been comfortable with the new technology initially. Some teachers described having felt "*pushed up against a wall*" and having the feeling that the message from above was that the implementation would take place with or without them. Those concerns were presented to the team to which I2 responded:

> "This explanation, of things that happened, might be a correct one and there were probably those, among the teachers, that had this experience. I do not mean to undermine that, but sometimes big decisions need to be made in order for things to happen. Sometimes there is a need for big steps and that should not be something new and unfamiliar for teachers. It is a reality that is evident for all grownup people on the job market." (I2)

I2 claimed that the implementation process was in a way similar to what happens every few years when the national curriculum is revised by officials in the Ministry of Education. I2 added that things need to be put into a perspective, and sometimes it was essential for somebody with a broader perspective to make decisions.

I1 stated that while she/he celebrated the decision to bring tablets into the classrooms she/he considered it incredible that the municipality was courageous enough to make the decision:

> "One thing that I find characteristic about the implementation is the belief that this was, and is, the right decision and that this will lead to better education for the students." (I1)

I1 then stated that she/he agreed with some of the things mentioned by I2:

> "Sometimes employees must accept decisions that have been made. The nature of the teacher profession is that it takes place in isolation, and in a very particular environment because no two classes are the same." (I1)

5.2.1.3 Introducing the iPads to the teachers

The team was asked how the implementation had been presented to the teachers of the municipality and whether it had been introduced as some sort of a revolution in teaching or rather that the iPads had been put forth as extensions of the tools and methods already in place.

To this I1 answered that the first thing that the team wanted to do, after handing out iPads to 470 teachers and other staff members, was to create a positive ambiance among the teachers.

> "The very day after being handed the iPads all the teachers were invited to a celebration where experts from Iceland and abroad came to introduce the possibilities of using iPads in the classroom. The mayor of Kópavogur also came and addressed the teachers. There were then some drinks and discussions, so our first task was to create positive vibes among the teachers." (I1)

I1 recalls that at the end of that festive gathering, which 300 teachers attended, she/he heard differing opinions from teachers. Most seemed, in I1´s recollection, to have been positive, but there were certainly those that were not as pleased. I3 agreed and added that during her/his years working in the educational system in Kópavogur, she/he had come to see that teachers can be quite critical and opinionated. She/he continued:

> "In the very beginning of the process most teachers said that they felt ready and excited about the implementation, but when push came to shove that was not necessarily the case. We got all possible reaction from the get go." (I3)

She/he claimed that whilst some teachers were pleased there were those that saw it as a ridiculous process.

> "If we would have wanted all the teachers to have a say in the matter regarding the implementation it would have taken place in 2020 or 2030. Even as late as 2050. If we always wanted to have everyone on board from the very beginning and make sure that every opinion carried the same weight things would never change. We would still have horse carriages in our streets. Somebody needed to make big decisions." (I3)

I1 continued the conversation and claimed that there had been different stages of the implementation. First came the handing out of the devices. During the teachers´ summer vacation seminars and lectures were offered to all teachers, and an open house every Friday in July as described in the previous chapter. She/he stated:

> "I remember, initially, people laughed at the idea of having open houses in the middle of the summer. People predicted that no one would show up. But we sometimes had about 50 teachers here at the same time, that is close to 10% of the teachers." (I1)

I1 acknowledged that during the first phase there was one thing that the team had failed to do, and that was to talk about the reasons why students were given iPads and how (and why) the municipality, with the help of the implementation team, planned on changing the teaching

methods. That was, according to I1 and the rest of the team, the time when teachers became displeased:

> "We were criticized for allowing ourselves to be opinionated about the work of teachers in general. We were considered to be judgmental about the way that the teachers had been working. We heard that the teachers felt that they were getting the message from above that what they had been doing up until the implementation had been wrong or not good enough. That our opinion was that once they would be equipped with iPads they could start teaching in a proper manner." (I1)

I3 had a similar story and described a meeting with parents and teachers where she/he had emphasized the importance of new methods in the classroom to meet modern demands. I3 claimed that teachers attending meetings expressed feeling that she/he was talking negatively about their methods of teachings and that he was belittling their work. That, T3 claims, was a surprise to her/him.

> "I thought to myself "were the methods of teaching in 2014 just perfect and with no room to make changes or adjustments?" When I said that there would be greater opportunities for individual based teaching methods, better co-operation between teachers and families, better co-operation between students, increased overview, innovative ways and more variety in assignments teachers got angry." (I3)

Interestingly, the consultants described they now feel obligated to start off discussion with teachers by telling them that they do not mean to generalize about individuals. That they are not telling them (the teachers), personally, that they are incompetent. I1 further claimed that the teams´ dialogue with teachers is meant to be general and to emphasize that teachers are not at all considered, by the team and the board of education, to be mundane or monotonous in their work. Rather, that the message is that:

> "We want teaching and learning to be exciting and to illustrate that we talk openly about teaching." (I1)

5.2.2 Phase 2:

5.2.2.1 Reflections on the implementation

When asked to summarize their current views on the implementation I3 emphasized that one of the main reasons for the implementation was to ensure that students remained update with

regards to technological advances. I3 stated that the variety of things that can now be done in the classroom and the diversity had proven to be positive:

> "I see a great progress in special care, among the students that need more assistance and the students that fall outside of the curve in both directions…We have also brought schools closer to what is going on in the society around the students. It used to be okay for schools to be 10-20 years behind, changes were slower. But if you are 10-20 years behind today, you don't stand a chance." (I3)

I2 agreed that everything that I3 had pointed out was true and added:

> "When we began this journey, the mentality was somewhat that we, the consultants, were just some authority figures that came in to assist. It was not really unlike the idea of travelling to the moon. People did not really know what we were doing." (I2)

I2 describes the reactions of the teachers to have been a bit cold and impersonal since people did not know how to deal with the team and what they represented. However, I2 concluded:

> "In my opinion, that is changing. We have managed to make a connection." (I2)

The three members of the team agreed that their presence has, over time, become a part of the professional culture in the schools in the municipality or as I2 stated:

> "We no longer pose a threat or manifest some imbalance. We are a regular part of the everyday life of the teachers. Teachers are no longer stressed or freaked out by our presence. In the early stages people were stressed in regards of the technology and the changes we presented, and we received questions from teachers like "What if the students take pictures?" and "What of the students are not studying, we have to able to remove the iPads!" and all sorts of exaggerated responses towards deviations." (I2)

Of note, I1 stated that the team repeatedly had to tell the teachers that they had faith in their professionality regarding how they wanted to approach the devices, but teachers wanted clearer rules:

> "Teachers felt insecure and asked for big posters to hang in their classrooms with rules and regulations printed in red letters on black backgrounds so that the students would know what they could not do. Many of the teachers felt that they had really come a long way implementing rules about what students were not supposed to do. Their reflection of us was that we were some sort of an authority there to tell them that they could not do their jobs in the manners they preferred. That we would not allow them to maintain discipline. In my opinion this reflection of us has changed a lot." (I1)

I2 agreed to that statement and added:

> "What I think is relevant here is that teachers have not been realizing that they have been taking part in the school of life. They have been a part of an educational procedure that is the most important procedure there is, namely uncertainty. Unfortunately, teachers, like all professions, need to feel that their environment is stable and safe. As soon as the environment becomes stable we stop learning…Teachers were thrown into a state of uncertainty, they absolutely were. They did not know exactly what was going on. But now they feel more secure and in their element." (I2)

5.2.2.2 Feedback

It was addressed by some of the teachers, during the interviews, that they felt that there had not been much effort to gather feedback from teachers. The team was asked how they had set about gathering feedback.

I2 responded by stating that it was a good idea to gather information from the teachers´ but more could be done:

> "What we have been trying to accomplish with using Facebook, for instance, is to share information and seek information from the teachers. We try." (I2)

I3 noted that the educational system in the municipality has certain channels of feedback:

> "We have been trying to encourage teachers to do just that, to share information and feedback on the Facebook page and use peer-education methods. But teachers have not asked us to do that. And it is somewhat problematic that when we try to do that teachers do not approve. They do not want us as an authority telling them what to do." (I3)

I1 concluded by stating:

> "I do not think that we could ever find a communicational solution that would fit everybody´s expectations." (I1)

5.2.3 Phase 3:

5.2.3.1 From "sage on the stage" to "guide on the side"

Finally, the team was asked whether the implementation had been meant to aid in the shift towards a more constructivist teaching methods. The answers gave a clear picture, as I1 stated:

> "That is what we want to happen. That the teachers are no longer the carriers of knowledge. students are supposed to be able to things on their own. They should no longer have to sit patiently and still and listen to what they are supposed to do and how to do it." (I1)

I3 agreed and wanted to reiterate, at the end of the interview, that what has been happening in the schools of the municipality should not be referred to as an experiment:

> "We would never experiment on children. This is an implementation, a procedure. We never thought that if this would not go according to plan we would just give up, shelf the iPads and go back to the way things were done before." (I3)

6. Discussions

Technology plays an ever-increasing role in education with information and communication technologies changing the landscape and working environment for teachers and students alike. Neil Selwyn stated that:

> "Education extends far beyond matters of learning and engaging with knowledge and that in modern times, in the organizational sense, digital technologies are central to the "formal" organization and governance of compulsory and post-compulsory education. (Selwyn, 2016, p, 46)

In addition, Selwyn claimed that it is common sense to align digital technologies with change. (Selwyn, 2016) The change, here, often refers to improving learners´ skills, helping them engage in their studies and finding motivation, even enhancing and enabling students to learn. It can also refer to expansions of teachers´ capacities to teach and even increasing the relevance of educational systems to needs of modern society and economy. Some, like Prensky and Tapscott, have been even more extreme in their approach and definitions of changes brought about by technology and go as far as foreseeing digital technologies leading to a revolution in education. However, as Selwyn notes, this implies a "*contentious, violent, and bloody form of change*" since "*revolution conveys a sense of conflict, clashes of interests and ideologies*". (Selwyn, 2011, p. 24) Rather, he suggests that we should treat the descriptions of digital revolutions as aspirational stories as opposed to accurate descriptions of what is actually happening in education. The aim of this thesis has been to examine the impact of this "educational digitalization" on educators in the municipality of Kópavogur. The implementation in Kópavogur is the biggest one in the history of Iceland, never before has a municipality of a comparable size put a similar decision or plan into action; handing out iPads to all the students between 10 and 16 years of age, 4.700 students in total. In addition, all of the teachers of the municipality, close to 500, were equipped with iPads. In this study 18 teachers from all of the municipality´s schools and the implementation team were interviewed.

Firmin and Genesi pointed out that it can be expected that there will be times when students´ knowledge about using ICTs will exceed the knowledge of teachers and that this imbalance can cause insecurity among the teachers. (Firmin & Genesi , 2013)

> "ICT causes fear for some educators because the technical education can seem to be overwhelming, compared to the more traditional forms of education." (Firmin & Genesi, 2013, p. 1609)

The main findings of this study were in relation to the importance of support, feedback and active communication. Indeed, many of the teachers, in Kópavogur, felt that they had not been afforded the possibility to actively participate in the course of decision making processes - processes that ultimately affected their working environment tremendously. Many of the teachers interviewed described their fears of the changes brought forth by the implementation. Even those teachers that did not describe the sensation of fear still indicated, in their answers, that there were parts of the implementation that made them somewhat uncomfortable or nervous. Some were afraid of losing control, while other felt insecure due to their lack of technological skills. What many of the teachers described was that, in their experience, their authority was undermined by not being allowed to partake in decisions about their own working environment. Authority is, according to many scholars, empowering (Monstad, 2018) and therefore the undermining of authority can be considered to decrease the sensation of empowerment. In some of the teachers´ replies what was described could be interpreted as "bogus empowerment", that is to say the teachers were faced with greater responsibilities and workload but not offered additional time or other resources to carry out their new roles. Authentic empowerment on the other hand refers to empowerment processes where participants are given control over outcomes, thereby making them more responsible for their work. (Monstad, 2018) Which, again, was experienced by some of the interviewees.

One of the frameworks used in the analysis of this thesis, the TPACK framework emphasis that the success of a technological integration hinges on the combination of teachers pedagogical, content and technology knowledge. The TPACK framework emphasizes the importance of support for teachers to be equipped to deal with the shift in their surroundings when new technologies are being implemented. However, quite a few of the subjects in the study maintained that they received inadequate guidance with regards to the technology, prior to the start of the implementation. Of note, many of the teachers also mentioned their fear of making mistakes - a common notion among teachers faced with technological integration, as pointed out by Bitner and Bitner (2012) and Fullan (2001). Bitner and Bitner argued that fear, anxiety, and concern that teachers experience in the face of implementing new technology in the classroom, as a teaching and learning tool, needs to be addressed. (Bitner & Bitner, 2002) Furthermore, teachers must feel free to make mistakes using the technology in their classroom

and should not be made to fear potential loss of respect from their students, peers or superiors. (Bitner & Bitner, 2002) The results presented in this study highlight that this remains valid in current day Kópavogur, following the implementation of tablets in the classrooms of the municipality´s classrooms.

As previously stated Mechanic (1991) defined empowerment as a process where individuals develop ways to see a relationship between their goals and a sense of means to achieve them. An interesting finding was that those, among the teachers, that were the most optimistic, passionate and open to the implementation were those that rose in the ranks. That is to say, those most eager to work in an environment with the iPads, in the beginning, were those that received more responsibilities, became leaders in their schools and were more likely to feel as if they were participating in the procedure. Those that where more reluctant and dispassionate in the early stages, on the other hand, described how their opinions did not seem to matter and that they were not listened to. Thus, it could be argued that those most passionate and positive were given more authority and responsibilities to help their colleagues in becoming familiar with the devices and their potential and essentially empowered through becoming leaders among their peers. Arguably, teachers in Kópavogur did not have an equal share of valued resources and did not have the same opportunities to access and control in decision-making processes. An empowerment orientation, as suggested by Zimmerman (2012), should encourage community or organizational participants to be given an active role in the change process in order for it to be successful. The active role should not be limited to implementing the project, like the implementation of iPads in to the classrooms, but also and importantly, the role should include the setting of the agenda.

Also of note, those teachers that had a positive outlook and celebrated the arrival of tablets into the institutions and their classrooms were more likely to have adapted to the usage of devices and more creative in using the tablets as educational tools. This is in line with the notion of the "creative adapter" introduced by Donnelly, McGrarr and O´Reilly and ties into empowerment as creative adapters "*would have a strong sense of empowerment in their teaching*." (Donnelly, McGrarr, & O´Reilly, 2011, p. 1479)

Another interesting finding was that, even though the team in charge of the implementation offered a variety of methods to encourage teachers the teachers described that peer encouragement and peer education was the most effective way to develop and learn in this new environment. Those findings are in line with what Fullan (2001) identified in his research on change processes, where he found that ownership of something new is often shared and that

such shared ownership is often tantamount to change. Looking towards peers for assistance and support is common among teachers, and can, eventually, empower a learning community. (Fullan, 2001)

Importantly, the data indicates a certain lack of communications between stakeholders. For instance, a number of teachers described first hearing about the implementation from sources outside of their working environment. Some heard about it as a part of an election campaign by one of the municipality´s political party, others from colleagues or acquaintances. Furthermore, communications described by both the teachers and the implementation team were often colored by an "us and them" mentality. Teachers described a feeling of being pushed up against a wall with little, or no, means to speak their mind and that decisions in relation to their everyday working environment were being made without their input or say on the matter. Again, these opinions were more frequently described by the teachers that were more hesitant in the beginning than those that were excited and "on board". Conversely, the implementation team described how they had been criticized for allowing themselves to be opinionated about the work of teachers. The team agreed that they had oftentimes felt obligated to start their communications with teachers by apologizing or excusing themselves in order to not come off as overly critical.

The teachers´ descriptions shed a light on the fact that, even though the individual experiences described varied, the environment in which the teachers work has changed following the implementation of tablets in the classrooms. The teachers described arguments and frustrations related to excessive usage of iPads, but at the same time celebrated the varied ways in which they could approach assignments with the help of the iPads. As one teacher put it: "the students have the world in the palm of their hands". Fullan (2001) coined the term "implementation dip", where he stated that things tend to get worse before they better in educational change, when new approaches or technologies are introduced into the environment of teachers. It takes time for things to clarify and for people to cope with the meaning of change. Time is to be expected to pass where teachers struggle find their footing and ground after a change has been implemented.

One of the most emphasized aspects of the implementation was to empower the students and meet individual student needs. Less attention seems to have been paid to the needs of teachers. Teachers and the implementation team alike described the difficulties and problems during the very first phase of the implementation. Difficulties with the infrastructure were described, such as problems with Internet connection, difficulties with certain apps and other technical

obstacles. There were also difficulties with teachers´ competence utilizing the devices and problems with finding some sort of middle-ground with the usage of the devices and a lack of coordinated rules. The biggest pitfalls described by the teachers of the municipality were those of misusage of the devices, with students playing with the iPads rather than using them in a constructive and educational manner. Of note, many of the teachers described the behavior of their students to be addictive-like. Actions have since been taken for teachers to have better control of what the students do on, and with, their devices during classes. The debate of what constitutes "proper use" of the iPads is still ongoing and not all stakeholders are in agreement. The ideology of the implementation included an aspect where students were to have freedom in using the iPads in their daily life, in the classroom and during their leisure time alike. Many of the teachers interviewed described how this approach brought about an imbalance of their authority, how they had to negotiate with their students about the time spent on the devices and what was suitable usage – a conflict that had not been a part of their daily work routine until the appearance of the iPads. Some of the teachers described their resistance to this approach, which ultimately led to changes. That is to say that teachers were granted access to monitor what their students were doing on their iPads. Fullan (2001) stated that there were good reasons, both political and technical, to take resistors seriously since resistors tended to be right and that good things could be learned from their resistance. Another reason for taking resistors, among teachers, seriously was pointed out by Donnelly, McGrarr and O´Reilly (2011) when they stated that structural and cultural changes to schools would not improve the settings unless the importance of teachers would be taken into account from their lived reality. Indeed, it is in the hands of the teachers to implement the change.

Importantly, teachers complained about not being able to give feedback during the procedure, but the implementation team did not agree with the teachers on that matter and pointed out that there was an open Facebook page for exactly those purposes. Donnelly, McGrarr and O´Reilly (2011) emphasized that many teachers rely on the feedback from other sources when deciding what to do in their own classroom, hence the importance to provide regular feedback as well as collecting feedback and distributing it among teachers. Fullan, (2001) also elevated the notion that consultants in change processes should emphasize feedback to maximize the success of an implementation. Mishra and Koehler (2006) argued that traditional means of teaching educators to cope with new technologies, such as workshops or introducing tech specific software or hardware, were ill-suited for teachers to develop a deep understanding of technology and how to use it in their classrooms. The authors suggestion was

that teachers were best taught with a method they called learning by design. Learning by design approach, as described by Mishra and Koehler, suggests that teachers partake in design-based activities to deepen their understanding of the technologies they are to work and grasp richer context through learning by doing rather than sitting through lectures.

Finally, an important finding was that that out of all 18 teachers interviewed, not a single one of them wanted to go back to teaching without iPads. Even those, among the educators, that were the most dispassionate and resistant during the earlier stages of the implementation could not picture themselves teaching in an environment where tablets were not utilized. These findings go hand in hand with Fullan´s notion of the "implementation dip", as he argued that often changes in behavior come before changes in belief.

7. Concluding discussions and remarks

In this thesis I have presented a study focusing on the effect the largest iPad implementation in education in Iceland has had on teachers. During the implementation 4,700 students and over 450 teachers received iPads for educational purposes. The aim of the implementation was to prepare students for their future roles in modern society, teach them how to utilize ICTs in a respectable and proper manner, take more individual responsibilities in their own studies as well as to meet the personal needs of every student. This was a process that began with a political party stating that, if they would win an election they would supply students with tablets. The news spread among educational professionals, some of which celebrated the idea whilst others dreaded the thought. A team consisting of four individuals, that had all been teachers, was hired to lead the implementation.

By the spring of 2015 the teachers had all been given iPads, in the very last week before their summer vacation. They were expected to use some time during the summer to familiarize themselves with the equipment and prepare to start teaching. The team leading the implementation offered seminars, courses and open houses in the early stages of the of the process, some even during the summer vacation of teachers

Interestingly teachers were not involved in the decision-making processes and teachers were not active participants in the setting of the agenda. There were some teachers that were offered to join in on the decision about which devices were deemed most suitable, that attended meetings where devices were discussed, but that aside, there is not much evidence that teachers were offered a seat at the table with regards to deciding on the feasibility of implementing smart devices into the curriculum and the classrooms or how to do so.

As Mishra and Koehler (2006) pointed out "*having a framework goes beyond merely identifying problems with current approaches; it offers new ways of looking at and perceiving phenomena and offers information on which to base sound, pragmatic decision making*." (Mishra & Koehler, 2006, p. 1019) The basis of the framework that they introduced, namely the TPACK framework, was the understanding that the profession of teaching is a particularily complex activity. The authors consider teaching to draw on many kinds of knowledge and deem it a complex cognitive skill that takes place in an environment that is both ill-structured and dynamic.

I believe that the findings of this study are relevant in identifying obstacles in an implementation process such as the one that the municipality of Kópavogur has undergone. All

signs indicate that ICTs will be integrated into the educational system to a larger extent than we have seen in the past as it is neccessary to prepare students to the life that awaits them after their formal primary and secondary education is finished. The results of this study indicate the need to be mindful of involving, in an active sense, the professionals (namely teahcers) that are to implement the changes in their everyday working environment. Teachers should be engaged in the process that leads up to decisions, and be included in the decsion making processes. As Fullan wrote: "*Educational change depends on what the teachers do and think – it´s as simple and complex as that*." (Fullan, 2001, p. 115)

The results showed that an implementation process, such as the one studied, calls for intensive work from all stakeholders, teachers, principals, consultants and educational committees, as well as students. The organizational communication processes have to be executed with caution and sensitivity, as there is a likelihood of tensions due to changes in the working environment of teachers. Both teachers and the team leading the implementation described tensions in the earlier stages, that might be described as an "us vs. them" mentality. According to the responses, from teachers and consultants alike, this has since improved. An important aspect to take into consideration was pointed out by Fullan (2001), namely the importance for consultants not only providing technical skills, as that would not be sufficient for educational change. Consultants would also have to be mindful about how they enter they field and of how they approach teachers, provide feedback and support. (Fullan, 2001)

The implementation of tablets affected the working environment of the teachers greatly, according to teachers. The changes described by the teachers were both good and bad. The iPads were celebrated as tools for organizing the educators work, keeping all things in one place, improving ways of distributing and receiving students´ assignments and the possibility to present study material in numbers of new and "unusual" ways. Many of the teachers also considered the iPads to have improved their capabilities to meet the individual needs of students, as some were more advanced and needed more stimulation whilst others needed a slower pace, made possible by utilizing the tablets. The less fortunate changes were described as student distraction, as the students, according to the educators, have a difficult time separating the iPads from toys and are prone to start using them for non-educational purposes during classes. Another negative aspect was that many of the teachers felt that the students were spending too much time on their iPads, and the devices had taken over regular face-to-face communications within the school and during recess. Some of the teachers described how the students became addictive-like in their behavior and had problems with putting the iPads

away. Some teachers even described conferences with parents that were afraid of losing control when it came to the usage of the iPads in the students´ homes and in their free time.

The team in charge of the implementation had a clear vision as to how the iPads were to improve the educational environment, but it seemed as if communicating those visions had not gone well in all cases. The teachers were divided in their answers as to whether the vision was clear, some of them were well within the lines of what the implementation team described while others were less up to date. Here again it seems that communicational procedures could, and should, have been clearer from the beginning.

An interesting future study would be to see how the implementation procedure evolves in the coming years. It was evident that adjusting to the changes has (and continues to) taken time and effort, as some the participants in this study only recently accepted the iPads as tools in their classrooms. It would also be of interest to see whether the students become more focused on the iPad as an educational tool, rather than a toy, as they grow older and get to be more acquainted with the devices. Another thing that should be given consideration is the effect on the families of children that receive iPads from their educational institutions, since it was clear from the interviewees that not all parents feel that they have been allowed to have a say in the matter.

In conclusion, the results of this study indicate that incorporating and implementing a change in the culture and environment of schools is a complex task and calls for active communications whereby stakeholders should be offered the chance to weigh in and participate in the process.

References

Apple. (2010, 01 27). Apple.com. Retrieved from Apple Launches iPad: https://www.apple.com/newsroom/2010/01/27Apple-Launches-iPad/

Bennett, S., & Maton, K. (2010). Beyond the "digital natives" debate: Towards a more nuanced understanding of students´ technology experience. *Journal of Computer Assisted Learning*, 321-331.

Bhat, K. S. (2009). *Total Quality Management.* Mumbai: Himalaya Publishing House.

Bitner, J., & Bitner, J. (2002). Integrating Technology into the Classroom: Eight Keys to Success. *Journal of Technology and Teacher Education*, 95-100.

Blair, T. (1997). *Connection the Learning Society.* London: DFEE: Department for Education and Employment .

Bort, J. (2013, 05 30). *Businessinsider.com*. Retrieved from Microsoft invented a tablet a decade before Apple and totally blew it : http://www.businessinsider.com/heres-visual-proof-of-just-how-badly-microsoft-blew-it-with-tablets-2013-5?r=US&IR=T&IR=T

Bryman, A. (2012). *Social Research Methods.* Oxford: Oxford University Press .

Buckingham , D. (2007). *Beyond Technology: Children´s learning in the age of digital culture.* Cambridge : Polity Press.

Carl Reidsema, R. H. (2017). Introduction to the flipped classroom . In L. K. Carl Reidsema, *The Flipped Classroom: Practice and Practices in Higher Education* (pp. 3-15). Singapore: Spinger Nature Singapore Pte Ltd.

Council, T. S. (2017). *Good Research Practice.* Stockholm: Vetenskapsrådet.

Denscombe, M. (1998). *A Good Research Guide: For Small-scale Social Research Projects.* Buckingham: Open University Press .

Dewey, J. (1897). My Pedagogic Creed. *School Journal*, 77-80.

Donnelly, D., McGrarr, O., & O´Reilly, J. (2011). A framework for teachers´ integration of ICT into their classroom practice. *Computers and Education, Vol 57*, 1469-1483.

Elst, T. V., Baillien, E., Cuyper, N. D., & Witter, H. D. (2010). The role of organizational communication and participation in reducing job isecurity and its negative association with work-related well being. *Economic and Industrial Journal, Vol. 21*, 249-264.

Esteve, J. M. (2000). The Transformation of the Teacher´s Role at the end of the Twentieth Century: New Challanges for the Future. *Educational Review, Vol 52, No. 2*, 197-207.

Ferster, B. (2014). *Teaching Machines: Learning from the Intersection of Education and Technology* . Maryland, Baltimore : John Hopkins University Press .

Firmin, M. W., & Genesi, D. J. (2013). History and Implementation of Classroom Technology . *Procedia - Social and Behavioral Science 93*, 1603-1617.

Fullan, M. (2001). *New Meaning of Educational Change.* New York: Teachers College Press.

Gliksman, S. (2013). *iPad in Education for Dummies* . Hoboken, New Jersey: John Wiley & Sons.

Group, C. E. (1989). Empowerment Through Family Support. *Networking Bulletin: Empowerment and Family Support, vol 1.*, 1-22.

Gu, X., Yuankun, Z., & Guo, X. (2013). Meeting the "Digital Natives": Understanding the Acceptance of Technology in Classrooms. *Journal of Educational Technology & Society*, 392-402.

Gunnlaugsson, B. (2018, 03 01). Interview with the implementation team . (B. Hallgrimsson, Interviewer)

Gunnlaugsson, B., Sigurbjörnsson, E. B., Gunnarsdottir, K. B., & Gislason, S. H. (2017, 09 26). Breyttir Kennsluhættir í Kópavogi: Hugmyndafræðin að baki spjaldtölvuverkefni grunnskóla í Kópavogi. Kópavogur, Iceland.

Hallson, H. M. (2018, 04 03). *Mbl.is*. Retrieved from Gangnrýnir spjaldtölvuvæðingu skóla: https://www.mbl.is/frettir/innlent/2018/04/03/gagnrynir_spjaldtolvuvaedingu_skola/

Helsper, E. J., & Eynon, R. (2013). Digital Natives: Where is the evidence? *The British Educational Research Journal*, 1-18.

Holden , H., Ozok , A., & Rada, R. (2008). Technology use and Acceptance in the Classroom: Results from an Exploratory Survey Study Among Secondary Educating Teachers in the USA . *Inderactive Technology and Smart Education, Vol 5, Issue 2*, 113-134.

Horn, M. B. (2014). Blended: Using Disruptive Innovation to Improve Schools . Palm Springs California : iNACOL.

Jenkins, H. (2008). Media Literacy - Who needs it? In T. Willoughby , & E. Wood, *Children´s Learning in a Digital World* (pp. 15-39). Hoboken, New Jersey : Blackwell Publishing.

Jones, M. L., & Mitchell, J. K. (2016). Defining and measuring youth digital citizenship. *New Media & Society - Vol 18*, 2063-2079.

Kabali, H. K., Irigoyen, M. M., Davis, R. N., Budacki, J. G., Mohanty, S. H., Leister, K. P., & Bonner Jr, R. L. (2015). Exposure and Use of Mobile Devices by Young Children. *Pediatrics, Vol. 136, Issue 6* .

Kalonde, G., & Mousa, R. (2016). Technology Familiarization to Preservice Teachers. *Journal of Educational Technology Systems, Vol 45, Issue 2*, 236 - 255.

Kelly, K., Clark, B., Brown , V., & Sitzia, J. (2003). Good Practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care, Vol. 15, issue 3,*261-266.

King , A. (1993). From the Sage on the Stage to the Guide on the Side . *College Teaching, Vol 41, No. 1*, 30-35.

Koehler, M. J., & Mishra, P. (2009). What is technological pedagogical content knowledge? *Contemporary issues in technology and teacher education, 9*, 60-70.

Koehler, M. J., Mishra, P., & Cain , W. (2013). What is Technological Pedagogical Content Knowledge (TPACK). *The Journal of Education Vol. 193 No. 3*, 13-19.

Kopavogur.is. (2018, 04 11). Retrieved from Spjaldtölvur í grunnskólum: https://www.kopavogur.is/is/ibuar/daggaesla-og-skolar/spjaldtolvur-i-grunnskolum-1

Kópavogsbær. (2014, September). *Innleiðing á spjaldtölvum.* Kópavogur: Kópavogsbær. Retrieved from Innleiðing á spjaldtölvun: innleiding.com

Kvale, S. (2007). *Doing Interviews.* London: Sage Publications Ltd.

Lög um grunnskóla. (2008, 06 12). Retrieved from Alþingi.is: https://www.althingi.is/lagas/nuna/2008091.html

Livingstone, D. W. (2001). Adults´ Informal Learning Definitions, Findings, Gaps and Future Research. *The Advisory Panel of Experts on Adult Learning* (pp. 1-49). Toronto: Centre for the Study of Education and Work.

Loveless, A., & Ellis , V. (2001). *ICT, Peagogy and the Curriculum: Subject to Change.* Abingdon, Oxon : Routledge / Faler .

Margaryan, A., Littlejohn, A., & Vojt, G. (2011). Are digital natives a myth or reality? University students´ use of digital technologies. *Computers & Education*, 429-440.

Mason, J. (2006). Mixing methods in a qualitatively driven way. *Qualitative Research* , 9-25.

McQuiggan, S., Kosturko, L., McQuiggan, J., & Sabourin, J. (2015). *Mobile Learning: A Handbook for Developers, Educators and Learners.* Hoboken, New Jersey: John Wiley & Sons.

Mechanic, D. (1991). *The study of Research Choices and Dilemmas: New Directions.* New York : Cornell University.

Migliorino, N. J., & Maiden , J. (2004). Educator Attitudes Towards Electronic Grading Software . *Journal of Research on Technology in Education* , 193-212.

Mishra, P., & Koehler, M. J. (2006). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record, Volume 108, Number 6*, 1017-1054.

Monstad, T. (2018). Change Processes, Practices of Authority and Communication: Authority Negotiations Between Managers and Employees in two Medical Companies. *Communicazioni Sociali*, 21-32.

Monstad, T. H. (2015). *Attempts to Bridge the Gaps: Opportunities and Challanges in the Communicative Constitution of Organizations.* Uppsala: Uppsala Universitet .

Montrieux, H., Vanderlinde, R., Courtois, C., Schellens, T., & Marez, L. D. (2013). A qualitative study about the implementation of tablet computers in

secondary education: the teachers´role in this process. *Procedia - Social and Behavioural Sciences*, 481-488.

Mossenberger, K., Tolbert, C. J., & McNeal, R. S. (2007). *Digital Citizenship: The Internet, Society and Participation.* Massachusetts: MIT Press.

Mumtaz, S. (2006). Factors affecting teachers´ use of information and communication technology: a review of the literature. *Journal of Information Technology for Teacher Education* , 319-342.

O´Keeffe, G. S., & Pearson, K. C. (2011). Clincal report - The Impact of Social Media on Children, Adolescents, and Families. *Pediatrics: Official Journal of the American Academy of Pediatrics*, 800-804.

Orb, A., Eisenhauer, L., & Wynaden, D. (2000). Ethics in Qualitative Research. *Journal of Nursing Scholarship*, 93-96.

Page, N., & Czuba, C. E. (1999). Empowerment. What is it? *The Journal of Extension, vol. 37*, N/A.

Patterson, M. G., West, M. A., Shackleton, V. J., Dawson, J. F., Lawthom, R., Maitlis, S., . . . Wallace, A. M. (2005). Validating the organizational climate measure: links to menagerial practices, productivity and innovation . *Journal of Organizational Behavior*, 379-408.

Peters, L. (2008). Meeting the Needs of the Vulnerable Learner: The Role of the Tracher in Bridging the Gap Between Informal and Formal Learning Using Digital Technologies . In T. Willoughby, & E. Wood, *Children´s Learning in a Digital World* (pp. 104-119). Malden : Blackwell Publishing .

Prensky , M. (2001). Digital Natives, Digital Immigrants. *On The Horizon - MCB University Press Vol. 9, No. 5* , 1-6

Rani, M., Srivastava, K. V., & Vyas, O. P. (2016). An ontological learning management system . *Computer Applications in Engeneering Education* , 706-722.

Rappaport, J. (1984). Studies in Empowerment: Introduction to the Issue. *Prevention in Human Services, vol 3*, 1-7.

Reese, W. J. (2010). *History, Education, and the Schools.* New York: Palgrave MacMillan.

Rennstam, J., & Wästerfors, D. (2015). Att analysera kvalitativt material. In G. Ahrne, & P. Svensson, *Handbok i kvalitativa metoder* (pp. 220-236). Stockholm: Lieber .

Saldaña, J. (2009). *The Coding Manual for Qualitative Researchers.* London: Sage Publications Ltd.

Sallis, E. (2002). *Total Quality Management in Education* . New York: Routledge.

Schutt, R. K. (2002). *Qualitative research and evaluation methods 3rd ed.* . Thousand Oaks, California: Sage Publications.

Seale , C. (1999). *The Quality of Qualitative Research.* London: Sage Publication Ltd.

Selwyn, N. (2011). *School and Schooling in the Digital Age: A Critical Analysis* . London & New York : Routledge .

Selwyn, N. (2016). *Is Technology Good for Education?* Cambridge: Polity Press.

Tapscott, D. (2009). *GrownUp Digital: How the net generation is changing your world.* McGRaw-Hill.

Thomas, D. R. (2006). A General Inductive Approach for Analyzing Qualitative Evaluation Data. *American Journal of Evaluation, Vol. 27, No. 2*, 237-246.

Traxler, J. (2014). Introduction: The prospects for mobile learning. *Prospects*, 13-28.

Vainio, A. (2012). Beyond research ethics: anonymity as "ontology", "analysis" and "independence". *Qualitative Research* , 685-698.

Venezky, R. L. (2007). Technology in the classroom: steps towards a new vision. *Education, Communication & Information* , 3-21.

Zimmerman, M. (2012). Empowerment Theory: Psychogical, Organizational and Community Levels of Analysis. 44-63.

Appendix:

Question guide list for the interviews with the teachers and the implementation team:

1. Do you remember when you first heard about the implementaion and can you describe how you felt when you first heard about the plans of the implementation.
2. What did you initially foresee as potential advantages of utlizing iPads in your class?
3. What did you initially foresee as potential obstacles?
4. Can you describe the communication in the early stages of the implementation and how what the change introduced to you and your fellow teachers?
5. Did you feel like you had a "voice" in the procedure?
6. How have teachers been encouraged and shown support?
7. After having worked with the iPads for this time, up until today, what do you see as positive apsects of the implementation?
8. What do you see as negative aspects?
9. What could have been done better, in your opinion? If you could, hypothetically, send a message back in timem what would it be?
10. What are the biggest advantages of using iPads in the classroom, in you opinion?
11. What are the biggest disadvantages of using iPads in the classroom, in your opinion?
12. Can you describe the support that teachers get today?
13. How is feedback given?
14. Can you describe the communications between the teachers and the team in charge of the implementation?
15. Has the implementation, in your opinion, caused studies to be more individual orientated?
16. Would you like to go back to teaching without iPads?
17. Can you describe the communications with the families of the students, are the families pleased with this addition?
18. Research has shown that a big obstacle in the implementation of technology into educational institutions is that teachers fear technology and making mistakes. Is that something that you relate to?
19. Digital Citizenship, is that a concept that you systematically work with in your classes?
20. It has been stated that the role of the teacher has changed quite drastically in recent years. Alison King, for instance, stated that the role of the teacher was changing (or

should change) from being the sage on the stage, to being the guide on the side. Is this something that you associate with the implementation?

21. Have you used the iPad to create your own teaching materials?