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Degree of Harmonisation of Simultaneous Use of Many ICT Platforms from Upper School Teachers' Perspective

A Case Study at Internationella Engelska Skolan
Tyresö

Information Systems

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Abstract

Teaching is one of the professions suffering from high workload and stressful work environment. The number of different ICT platforms used in school, their similarity in their purpose, complexity and differences in interfaces, make it very complicated for the new teachers to smoothly start effective teaching, due to lack of time and resources for comprehensive onboarding process. There is no time during school year for effective training for the teachers to raise their digital competence and organise training to use ICT platforms. At the same time the teachers are imposed to use specific ICT platforms chosen by the organisation for educational and administrative purposes. They experience pressure to perform from the employer, students, and their parents. It is important for the teachers to harmonise simultaneous use of many ICT platforms.

The purpose of this bachelor thesis in Information systems is to identify, describe and explain degree of harmonisation of simultaneous use of many ICT platforms among upper school teachers at one Swedish school.

The case study method has been applied and a literature study has been carried out in the bachelor thesis in Information systems. Internationella Engelska Skolan Tyresö has been used as the case study company. The study is concentrated on Swedish upper school teachers, which defines grades 7-9 (students age 13-16). A research literature-based analysis model was developed in order to be able to more precisely investigate the chosen purpose. Based on the literature study, a conceptual model has been designed. In the chosen qualitative approach, a semi-structured interview guide was developed, based on the conceptual model. Five interviews with upper school teachers in the case study school were conducted by personal communication.

The analysis of the collected primary empirical data has led to the following conclusions. Amount of administrative work and school's choice of ICT platforms for this purpose have big impact on teachers. Training in use of all imposed ICT platforms is crucial for the teachers. Hardware in school available for teachers and students is also important factor affecting use of ICT platforms. Degree of teachers' involvement in creating ICT policy, degree of administrative support, degree of leadership involvement towards implementation of ICT policy, degree of accessibility to ICT were identified as the most important factors affecting degree of harmonisation of simultaneous use of ICT platforms by Upper School Teachers.

Keywords: ICT platforms, ICT in school, ICT in education, Teachers' perception of ICT, ICT usage in teaching practice, Usability of ICT platforms.

Preface

I would like to thank my wife for love and support she gave me during my work on the thesis and whole time spend on Karlstad University. Understanding and help during that time was indispensable and I would not be able to do it without her. Also, I am deeply grateful to my mother-in-law who always believed in me.

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I am also grateful to all employers of Karlstad University for the knowledge, experience and help I received in all years of my studies. Thank you to my peers during the studies for inspiration and shared time.

I will remember this sentence as a valid lesson: “If I had an hour to solve a problem I would spend 55 minutes thinking about the problem and 5 minutes thinking about solutions”.

Piotr Piotrowicz

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1. Introduction

1.1. Problem background

Teaching is one of the professions suffering from high workload and stressful work environment. With their goal to prepare developing humans to live in the new digital times, the teachers need to pass on knowledge that is justified for the “now” and “in the future”. Some of the teachers received preparation for their job in form of higher education in teaching 10, 20 or even 30 years ago. It is a very challenging mission to continuously develop professionally in so dynamic area, such as technology, and to be able to pass on this knowledge further to students. The average age for the teachers working in schools in 2019 was between 45–47 years and according to statistics approximately 68% of teachers were over 40 years old in 2019 (SCB 2020). This means that they were over 21 years old in 2000, when the first camera phone in the world was released in Japan (Uswitch 2022) or the first USB flash drive was sold in Singapore (The New Yorker 2013). Research show that teachers who grow up with extended experiences of using technology identify themselves as technology users and have the habit or disposition to use it (Hammond 2011:206). Teachers might be not necessarily interested in learning about new technologies, but there is a need and pressure on them to constantly get education in this area. Teachers must be skilled in using technologies to be able to do their work properly. Educators need to use Information Technology (IT) to successfully provide teaching in all school subjects. Continuous studies on teachers’ digital competence are necessary to be able to understand if one of the problems in education is lack of IT competence among teachers (Regeringskansliet 2017:14).

The problem for the teachers without adequate digital competence already starts at their first day in school during onboarding process. The starter pack contains tools for Information and Communication Technologies (ICT), which is a very important term in modern education. Teachers receive a computer, a mobile phone, all login credentials for different platforms and instructions with the routines to follow. Governments in many countries invested large amounts of public resources to buy ICT equipment for educational sector (Witte 2014:173) but considering how very few of studies confirm the positive effects of ICT on learning outcomes (Fernandez-Gutierrez 2020:1), there is a tremendous pressure on school management and school administrators to make the best use of the resources (Murithi 2013:197). According to Murithi (2013:197) it is the non-teaching staff working in school that is responsible for implementation and promotion of ICT including its organization by e.g., providing school ICT policy and distribution of all digital tools, e.g., hardware, software, etc.

The idea to analyse degree of harmonisation of simultaneous use of many ICT platforms from upper school teacher’ perspective appeared after interview with the principal of Internationella Engelska Skolan Tyresö (IES Tyresö). Harmonisation can be defined as “the adjustment of differences and/or inconsistencies among different measurements, methods, and procedures to make them uniform or mutually compatible” (Damoiseaux 2020:1). Harmonisation of simultaneous use of ICT platforms from upper school perspective is the adjustment of differences and inconsistencies in simultaneous use of ICT platforms to make them mutually compatible from upper school teachers’ perspective. According to Damoiseaux (2020:1) harmonisation is typically achieved by agreement as consolidated in recommendations and/or guidelines. IES Tyresö is a compulsory school with both: middle and upper school students (grades 4-9). According to the principal (see Appendix 1), digital competence of the teachers is very differentiated, from very low up to high knowledge, depending on the age, experience, education, and interests. The teachers he met in his career very often did not understand what digital transformation is and how it affects them individually. Their focus was on the ability to handle a computer and use entertaining software that is engaging and fun for the students, without any pedagogical aim. School principal wants to make sure that the teachers with lowest degree of digital

competence in school compared to their colleagues are still able to deliver quality lessons to the students using ICT and can be successful in administrative part of their roles.

The number of different ICT platforms used in school, their similarity in their purpose, complexity, and differences in interfaces, make it very complicated for the new teachers to smoothly start effective teaching, due to lack of time and resources for comprehensive onboarding process. There is no time during school year for effective ICT training for the teachers to raise their digital competence and organise training to use ICT platforms. According to the principal, there are more urgent training sessions for the teachers to provide, e.g., introduction of new curriculum (LGR22). The lack of training in use of ICT platforms in the organisation in combination with low digital competence among staff created questions requiring deeper investigation to identify, describe and explain harmonisation of simultaneous use of many ICT platforms.

1.2. Purpose

The purpose of this bachelor thesis in Information systems is to identify, describe and explain degree of harmonisation of simultaneous use of many ICT platforms among upper school teachers at one Swedish school.

1.3. Target group

The results in form of the conclusions from analysis of degree of harmonisation of simultaneous use of many ICT platforms by upper school teachers in IES Tyresö can be used by the leadership of the school for handling the issues in the organisation. The knowledge could benefit future students, researchers, any education leaders. The study could be also a cause to proceed changes in organisation of IES Tyresö.

1.4. Scope

The study is concentrated on Swedish upper school teachers, which defines grades 7-9 (students age 13-16), to investigate usage ICT platforms for teaching, grading, communication with staff, students and their parents, along with other school-related purposes.

1.5. Swedish school system

Education in Sweden is governed by The Swedish Ministry of Education and Research that is responsible for the Government's education and research policies. The Ministry takes care of school performance, conditions for teachers and study financing (Government.se 2023a). On behalf of the ministry, The Swedish National Agency for Education (in Swedish: "Skolverket") oversees the Swedish public school system for children and adults. Their responsibility is also to promote that all children and students have access to education and activities that are equivalent of good quality in a safe environment (Skolverket 2022a).

Sweden has three levels of government: national, regional and local. At the lowest level, Sweden is divided in 290 municipalities (Government.se 2023b) responsible for offering a place to a child in school in a certain amount of time depending on the age of the child (informationsverige.se 2023).

School organiser decides how the school should work, ensures that the school has the necessary resources and must constantly work to make the school better. It is the school organiser who is responsible for all students reaching the goals. The school organiser must also ensure that the learning process complies with the existing regulations. In Sweden municipality is the organiser of municipality schools. For free schools that belong to private institutions, it is the company board that is the organiser of the school (Skolverket 2022b).

In the Swedish school system according to The Swedish National Agency for Education there is possibility to go to school from age of 1. Preschool is optional to sign children to, where children should

have the opportunity to develop and learn through play and creation on their own, in groups and together with adults (Skolverket 2023).

For children in age of 6 it is obligatory to join a preschool class, as presented in Figure 1. After that children start in obligatory compulsory school or other corresponding school forms. Students in age between 6 and 13 years old can use a form of before or after school activity facility, which is called leisure-time centre. It is also open during vacation or other school breaks. The purpose of leisure-time centres is to fulfil meaningfully students' time during their parents' work or study time. Most of youths join upper secondary schools in age of 16 with a purpose to start to work directly after graduation or be ready to continue with any form of adult education, as draw in Figure 1 (Skolverket 2023).

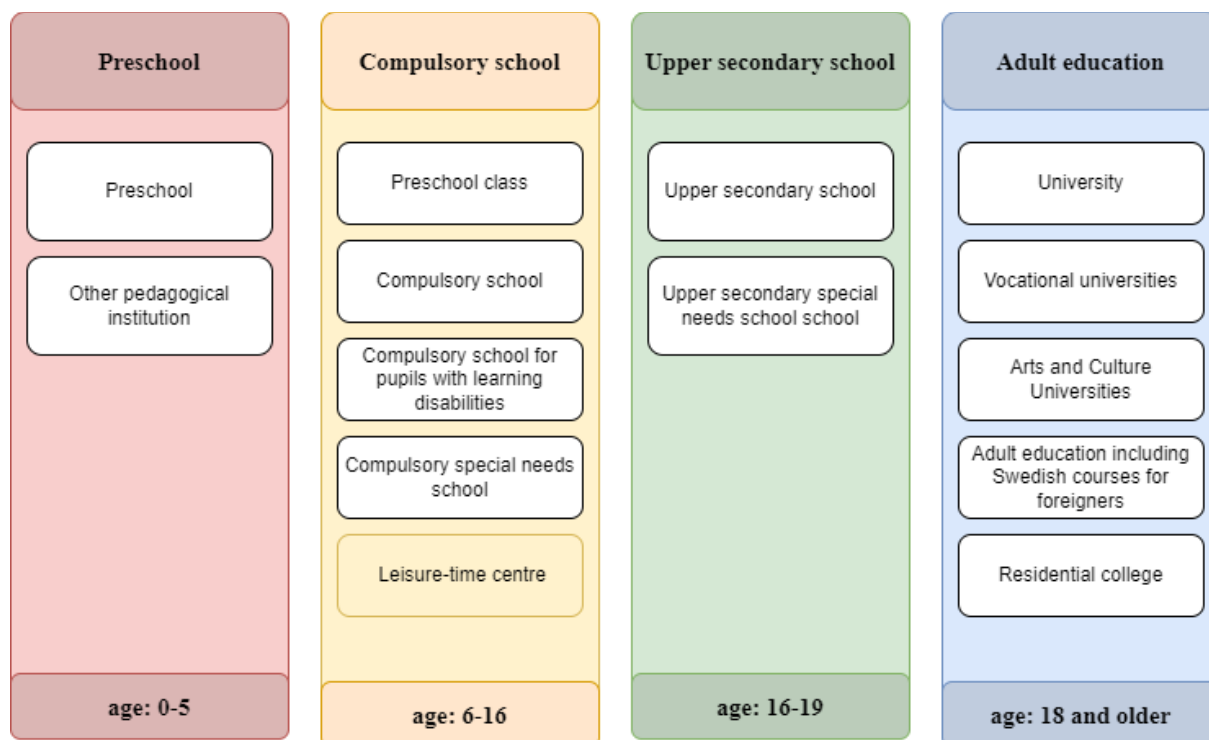


Figure 1: Difference between digitization, digitalization and digital transformation
Source: Skolverket (2023).

According to Skolverket (2022c) in Sweden compulsory schooling (in Swedish “skolplikt”) is an obligatory education for all children in age 6 – 16. Preschool class is a form of preparation for compulsory school in grades 1-9 (students age: 7-16). Compulsory school is divided in three stages based on year levels:

- lower school (grades 1-3, age: 7-10)
- middle school (grades 4-6, age 10-13)
- upper school (grades 7-9, age 13-16)

1.6. Difference between IT and ICT

There is a significant difference between IT and ICT, which is important to mark. Merriam-webster dictionary defines Information Technology (IT) as “the technology involving the development, maintenance and use of computer systems, software and networks for the processing and distribution of data” (Merriam-Webster 2022). The part of it is ICT, which is defined as a “diverse set of technological tools and resources used to transmit, store, create, share or exchange information”. These include all communication devices (computers, mobile phones, tablets), the Internet (websites, platforms, email communication), different livestreaming and broadcasting technologies (radio, television, webcasting),

recorded streaming and broadcasting technologies (podcasts, audio and video players, storage devices), also telephony (stationary, mobile, satellite, video-conferencing, etc.). ICT is part of IT that makes possible sharing of information including all necessary actions, resources and tools (UIS 2009:120).

The definition of IT platform is “any hardware or software used to host an application or service” (TechTarget 2022). This means that definition of ICT platforms changes the context similarly in this case, as it does in the relation IT-ICT: “any hardware or software used to host an application or service used for communication and data sharing”. Example of common ICT platforms used in Swedish schools are Google Workspace for Education Fundamentals, Microsoft Education or SchoolSoft.

1.7. ICT in Swedish schools

Göteborgs-Posten (2018) notices quickly raising wave of usage the electronic devices in schools without deeper thought or plan. There are also questioned digital competences of teachers who are supposed to pass it on to future citizens of the world. The article states that decimal thousands of teachers every day use digital resources and at the same time many teachers demand digital competence development in order to be able to handle the technology itself and to and even greater degree to have better selection of tools based on pedagogical needs that benefit students’ learning.

Swedish Curriculum for the compulsory school, preschool class and school-age educare (Skolverket 2022d:257) begins the chapter about teaching the technology subject with words “the driving forces behind the evolution of technology have been a desire to solve problems and meet human needs”. Raising usage of technology in all aspects of our lives and digital transformation of the world sets new challenge for a human. The list of “key competences” is a combination of knowledge, skills, and attitudes to adapt in current environment. Recently one of the “key competences” has become “a digital competence”, which is define as “being familiar with digital tools and services and to have the ability to follow digital development and its impact on a person’s life” (Riksdagen 2015:12). The Swedish National Agency for Education has already three times (in 2009, 2013 and 2015) improved the national picture of ICT usage and digital competence for the students, teachers, and principals. The time in lessons spent with the digital resources, such as computers, tablets, mobile phones connected to Internet and usage of email, different kinds of software has grown very fast. In Swedish primary schools (students’ age 10-16) there is 1,3 students per a computer (Skolverket 2019) in compare to only 3,0 in 2012. Now all teachers have access to computers compared to only 75% in 2012 (Riksdagen 2015:13).

Success factors for teaching and learning with use of digital tools are the teacher's digital competence, ability to lead schoolwork, integrate digital tools and resources in teaching and provide students with clear but achievable challenges. However, the expectations and speed of development in today’s digital world throw new challenges to the classroom, where the teachers are responsible to use adequate tools for education of their students. Without right competences the usage of digital tools and digital resources can have negative effect on students’ development. Together with this, the students are more exposed on the risk of stress and distractions (Regeringskansliet 2017:8).

The main purpose for implementing ICT in schools was to support administrative work and services for better quality and efficiency for the students at those institutions. Fast proceeding digital transformation of educational facilities around the world has awakened hopes of educational leaders for positive influence on education itself, especially in the aspect of new technologies. Extensive development of ICT in education also changed role of teacher in class. Instead of being the source of knowledge or authority, the teachers around the world became more partners and facilitators of learning (Ma 2010:275). According to the research made in Japan, the digital competence of the teachers and its development does not go in the same pace together with digital transformation and Information and Communication Technologies (ICT) integration in school (Terashima 2019:6). Strong need for more research about the digital transformation in schools is stated by the disappointment expressed due to lack of enough study in this area.

Digital competence is required to be able to be successful in using ICT. This means that teachers should have skills to benefit from handling devices, software, and routines in teaching, but also to do administrative work that every teacher is required to provide. According to Skolvärlden (2022) the workload of administrative work is the biggest problem for the teachers in Sweden with 53% professionals claiming issue. The same problem is the top obstacle for last five years, according to the same survey made year by year. Skolvärlden (2016) mentions that 50% of teachers' work is pure administration. In these days administration in schools is based entirely on ICT tools, which in consequence of lack enough digital skills extends the time spent on those kinds of tasks for every individual.

Regardless of digital competence within staff all teachers concentrated in each organization work on the same ICT platforms, which they either must be trained to or they already have training and experience in usage from previous work. As it could be noticed, all have similar possibilities and can be used by school administration and teachers to similar tasks and keeping data for the same purpose. Guidelines and routines where to do what and for which purpose and developing of digital competence are part of responsibility of school leadership (SKR 2019:21), but training for all platforms used in the school that might be different to each other is also required. All those problems leave the users (the teachers) with a number of issues how to cope with many ICT platforms for different purposes. According to The Swedish National Agency for Education, it is the school principal together with school organiser, who are responsible for continuous, under longer time, during work hours and recommended under supervision, development of digital competence for the teachers (Skolverket 2022e). Digital tools and its organisation should be provided accordingly also by the principal. Technical support and infrastructure are very important for the availability of the resources obligatory according to the standards in modern teaching and constituted by Swedish curriculum (Regeringskansliet 2017:7). Many limitations, lack of needed resources and its failure rate are the possible areas for digitalisation failure for each school. The schools' challenges could be similar but depending on different factors and organisational environments could be different. Research in this area is necessary to be able to later state the action program on to deal with the issues for the purpose of equal access and usage of the resources (Regeringskansliet 2017:5).

2. Methodology

2.1. Choice of Subject

The idea for the investigation in the area of ICT in school started with literature review and a discovery that the topic of digital transformation of school and implementation of ICT in education is a field of many research and debate. I worked in a Swedish compulsory school for many years in a role of a teacher and later IT representative, which helped me to understand how many problems with ICT teachers deal with every day, due to lacks in the organisation or simply lack digital competence. The group that is affected the most with changes of the school curriculum, digital transformation and continuous development of technology are upper school teachers (grades 7-9). In compulsory schools they have more detailed and complicated curriculum to pass on than lower (grades 1-3) or middle (grades 4-6) school teachers.

To find the current subject of investigation, the first step was to contact school leadership and make pre-interview with school principal. He pointed out that the teachers have many tools, but very often they do not know how to use them properly to reach the best learners' interest. He also stated that the teachers recurrently miss the purpose for usage of certain tools. Following this information, the principal stated that one of the reasons for this could be the number of ICT platforms that teachers use in their work, lack of clear routines and instructions and then lack of time to pass on the existing ones. We came

to conclusion that degree of harmonisation of simultaneous use of many ICT platforms could be a challenge for upper school teachers in IES Tyresö and it requires further investigation.

2.2. Demarcation

The investigation is about degree of harmonisation of simultaneous use of many ICT platforms by upper school teachers (grades 7-9) in one Swedish school. In this study case the choice of unit of analysis has been decided due to high complexity of Swedish curriculum for grades 7-9 in compare with other group present in this school: middle school teachers (grades 4-6), who have less complexity in Swedish curriculum. For better understanding of the organisation, I conducted a pre-interview with school principal.

The upper school teachers' perception will be investigated in terms of using ICT platforms for work in school, both teaching in class and their administrative responsibilities. Teaching in class persists using ICT platforms for lecturing with presentation, administrate students' attendance, letting the students to handle ICT platforms on computers or tablets together with the teacher, etc. Administrative responsibilities consist of planning lessons, grading, communication with colleagues, communication with parents, etc.

2.3. Qualitative Research

This study uses qualitative method for the research according to Patel & Davidson's (2003:94-138) guidelines. There are 5 semi-structured interviews held by me with the upper school teachers in IES Tyresö for the purpose of this study. The interviews followed a semi-structured interview guide. Questions were asked to look for the tendencies, trends and patters which were concluded with key problems with the degree of harmonisation of simultaneous use of many ICT platforms perceived by the teachers.

According to Patel & Davidson's (2003:104-105) the interviews must be confidential, which means that only the interviewer knows the personal identity of the people who are talked to. It is also important that the interlocutors are well informed about the purpose of the research, all safety and data privacy precautions in the first place, before the interview starts. Semi-structured interview means that the researcher composes the list of open questions, so the interviewed person has the freedom to formulate thoughts and answer in a chosen way. In qualitative research the interviewer and the interlocutor are together the co-creator of the content of the conversation. In this matter the researcher's role is to outline the problem, while the respondent is supposed to give direct insights into it. In this study the empirical data is analysed depending on existing literature.

2.4. Literature Review

The literature for the purpose of this research have been collected depending on one university library and Swedish and international search services: Digitala Vetenskapliga Arkivet, Karlstad University, Google Scholar and IEEE Xplore Digital Library. The following key words were used to complete the material for the research: ICT platforms, ICT in school, ICT in education, Teachers' perception of ICT, ICT usage in teaching practice, Usability of ICT platforms.

Due to nature of dynamic technological development, it was important to find latest research articles to base thesis in Information systems. It was also obligatory to analyse latest governmental reports, directives, and laws to set the scene in chapter 1.1 describing problem background accompanied by debate articles and other publishing. Theory based in this study on the books or research articles that are relatively old were confronted with current knowledge and research. This means they are still valid and could be used beneficently in this paper.

2.5. Conceptual model

In this study the conceptual model was created based on the study purpose and literature research. The conceptual model, called also “conceptual framework”, “research framework” or “research mode”, in this study was composed for the reason of mapping the theory in the most understandable way for the reader. The main purpose of chosen model was to give us an overall overview that aims to be able to analyse the studied reality (Fredriksson 2021).

According to Fredriksson (2021) conceptual model consists of graphical or narrative explanation of “the main things to be studied – the key factors, variables, or constructs – and the presumed interrelationships among them”. It should be build based on the most central factors perceived by the author to explain the reader or/and understand for the reader the dependable variables according to the chosen purpose. For the best understanding of the research, the graphical model is presented with entire framework on a single page. The conceptual model is the key for the author to compose direct questions for the semi-structured interview and aim with it to the research purpose. The map around the concepts and their relationships that it builds helps to the interviewer on the right aim while getting answers for open questions.

2.6. Research Design: The Case Study Method

The compulsory school Internationella Engelska Skolan Tyresö has been used as a case study in this bachelor thesis in Information systems. A case study means, that the research is made on smaller limited group. A definition of case study is “a general term for exploration of an individual, group or phenomenon” (Starman 2013:31). In this particular paper it is a group of individuals in one organization. It also means that the study is taken from an overall perspective to cover as much information as possible basing on the theory and the conceptual model to proceed on the interviews with the employees in the organization (Patel & Davidson 2003:76-77).

According to Starman (2013:32) choice of method does not define a case study. It is more selection of what will be explored. There are many dimensions of how to classify case studies. The term is rather general and there are no official types in characterization due to impossibility to cover all of them. However, Starman (2013:33-34) classifies case study in two main dimensions: time and theory formation: retrospective case studies relating to the past, snapshot studies relating to one particular period of time, also current, and diachronic studies relating to change over time and are similar to longitudinal studies. On top of that, there are also multiple case studies classification, which does not apply to this paper. Classification according to the theory formations contains to what they contribute to theory building. In this paper case study is snapshot study with classification “heuristic case study”, which aim to “identify new, unexpected paths; for such studies, marginal deviant, or outlier cases may be particularly useful”.

In this study semi-structured interviews were conducted to collect empirical data, which allows to use personal perception in an organization for further analysis. The author of this thesis in Information systems have worked for Internationella Engelska Skolan Tyresö for eight years in role of IT representative focusing on ICT in the organization. There are positive and negative aspects of this. On the good note the author has easy access to the organization, its employees and school leadership. What was important to remember proceeding with this study, is that stay objective when composing questions, steering the interviews with the teachers, and focus on the problem itself with marking that the teachers in the company in this study case are representation to aim at research purpose with correct demarcation.

2.7. Case Organisation

Internationella Engelska Skolan is currently the largest operator of independent schools in Sweden for compulsory education (Engelska.se 2022a). IES was fully owned by its founder, Barbara Bergstrom, up till 2012. Since 2020, the majority owner is Paradigm Capital, a fund focused on investing in companies

in Northern Europe (Engelska.se, 2022b). According to statistics from autumn 2022 IES have more than 31 thousand students in 45 compulsory schools and one upper secondary school (high school). The company was founded in 1993 as bilingual school that follows Swedish national curriculum (Engelska.se 2022a). There are more than 3000 employees working for the company, including 2100 teachers with diverse education and background from across the globe; from Sweden, from a range of English-speaking countries, from Europe and beyond (Engelska.se 2022c).

Internationella Engelska Skolan in Tyresö is a middle and upper school with grades 4-9 established in 2014. The school is located in Tyresö, a municipality about 20 km southeast from Stockholm (Engelska.se 2022d). There are 960 students and 99 members of staff, 68 of whom are teachers. 49 all members of staff are Swedish and 50 of them are different nationalities from around the world. The multicultural environment applies to both: administration, and teachers (see Appendix 1).

IES Tyresö, along with other Internationella Engelska Skolan facilities in Sweden, use many ICT platforms in their IT structure. There are SchoolSoft, as main school administration tool and a way for communication with students' guardians, Google Workspace or Education Fundamentals for communication, main office utilities, and teaching, Happeo for intranet, Behaviour Watch for reporting information about students, and more platforms after their individual wish or for special purpose in specific roles, e.g., Hogia for school economist. All platforms in use must be GDPR (General Data Protection Regulation) safe and all users must be trained and controlled by Data Protection Contact Person. There is one IT representative in school, who is responsible for IT onboarding, implementation of all hardware and software, and technical support. IT representative receives templates, routine instructions and recommendations from Head Office Central IT Team and discusses IT issues and problems with IT representatives from other IES schools (see Appendix 1).

2.8. Semi-structured personal interviews

In this bachelor thesis in Information systems a qualitative research methodology was used. For gathering of primary empirical data I used semi-structured interviews. According to Patel & Davidson (2019:76) case study means that the study is made on a small limited group, in this case it is 5 representatives of upper school teachers in IES Tyresö. The interviews were made according to a specific plan in time and requirements for research according to the Patel & Davidson (2019:82-84) guidelines.

I designed the semi-structured interview guides (see Appendix 2) based on the research literature and the conceptual model (see Figure 3). The areas to cover by the interview guide were planned based on the variables in the conceptual model formulated with the research literature. The open questions asked to the interlocutors gave them the opportunity to openly formulate their thoughts about the area of concern. The interviews were recorded and transcribed (see Appendixes 3-7). I explored and interpreted the collected data after the transcription.

2.9. Choice of Respondents

To understand the harmonisation of simultaneous use of many ICT platforms by upper school teachers I chose a group of random representatives of upper school teachers in IES Tyresö. It was important to interview teachers from different departments that teach different subjects to receive the widest possible picture for the purpose of this study. All chosen teachers eagerly agreed to participate in the study.

Table 1: Summary of conducted semi-structured interviews.

Source: The author of the study

Role	Method	Length	Date
Teacher 1 - Upper School Teacher in IES Tyresö	personal communication	40 mins	2022-12-22
Teacher 2 - Upper School Teacher in IES Tyresö	personal communication	39 mins	2022-12-21
Teacher 3 - Upper School Teacher in IES Tyresö	personal communication	26 mins	2022-12-22
Teacher 4 - Upper School Teacher in IES Tyresö	personal communication	25 mins	2022-12-22
Teacher 5 - Upper School Teacher in IES Tyresö	personal communication	23 mins	2022-12-22

2.10. Validity, Reliability and Generalization

The highest possible quality and security of information is the key for successful study. Qualitative analysis requires those two aspects to be considered as valid and reliable (Patel & Davidson 2019:131-133). Gathering of the empirical primary data started with composing the plan for the study, probing dialogue with the principal of IES Tyresö (see Appendix 1), deep research according to the purpose of the study, constructing conceptual model for the study (see Figure 3) and then formulating open questions in the interview guide (see Appendix 2) for the semi-structured interview based on the variables from the model. The guide for the interviews was used as an instrument to for gathering primary empirical data. All interviews were audio-recorded and transcribed to interview protocols (see Appendixes 3-7) afterwards for the purpose of keeping the reliability of the study. The interviewed persons received the protocols and got the chance to make changes in case of any misunderstanding.

According to Patel & Davidson (2019:110) if the aim is not to include the whole target group in the study, it is right to consider a small representation of that group. In this study all interviewed upper school teachers work in this role between 4-28 years and are experience enough for the purpose of presentation of their perspective on the topic for the study.

2.11. Ethical consideration including GDPR review

One of important principles in GDPR is purpose limitation, which means that personal data cannot be processed in a different way that originally defined in study purpose (Meszaros & Ho 2021:3).

GDPR states that “processing of personal data for scientific research purposes should be interpreted in a broad manner, including, for example, technological development and demonstration, fundamental research, applied research and privately funded research”. According to Meszaros & Ho (2021:6) in Sweden there are specific regulations for scientific research, which clarifies broad EU regulation to data protection in Sweden.

3. Theory and previous research

3.1. ICT integration in schools

Information and Communication Technologies (ICT) is becoming one of the most important areas in modern education and usage of it has increased rapidly over the last few years in most developed countries, including Sweden (Fernandez-Gutierrez 2020:1). Lack of computers in schools is not an issue nowadays, as ICT has become a relatively routine part of every day practice (Witte 2014:174). Digital tools and equipment are expensive but considering how important it is becoming in modern days, many

governments have made big investments and now every educational budget includes spending on ICT development needs (Fernandez-Gutierrez 2020:1).

There is a long history of digitalisation of Swedish schools with start in '60s of XX century. Then the policymakers have noticed the significant interest from the educators how to use technology and computers and how that could affect schools (From 2020:72). Long history of integration of ICT in education is continued with a number of improvements in the curriculum set by The Swedish National Agency for Education (Skolverket) after every evaluation period. Together with technological and pedagogical development, The Swedish National Agency for Education first evaluates and then creates a new set of improvements in the national curriculum. Evaluation in this process is important due to fact that usage of ICT in school that is not integrated with a clear pedagogical purpose and with a pedagogical method can give worse results in school than no using ICT at all (From 2020:74-75).

Curriculum guides and places requirements on the teachers in regard to teaching program use in classes. Close relationship with ICT gives the teacher both opportunity and demand to use different ICT platforms in their job. In the same time, researchers identified that content and characteristics of curriculum influence ICT integration into teaching (Seifu 2020:3). Curriculum affects entire organization, because strategies on all levels of organization have to always be compatible with the curriculum.

In the first decade of XXI century The Swedish Government gave The Swedish National Agency for Education a mission to evaluate usage of digital resources and competence on all levels of education. In the reports from 2009, 2013 and 2016 it is stated that there is a need for strategical leadership and professional development on all levels in school. Additionally, there is a need to integrate ICT in teaching on more deliberate and structured way. Those aims are repeated once again more clearly and complexed in the changes to the curriculum being in place from autumn 2022 (From 2020:74).

Schools have to keep up with the technological development, so the students receive accurate education for the modern society where use of digital tools is one of the main parts of life. Assumption made by educators and scientists is that ICT has a positive influence on students learning (Wikan 2011b:1). Students have much better access to information and wider range of resources using Internet. Also teachers have more resources to offer their pupils. Due to access to more teaching material, the educators can make their lessons more complete attractive and interactive (Fernandez-Gutierrez 2020:2). It is confirmed that ICT-infrastructure helps teachers in their daily routines, e.g., by automating processes and reducing time spent on administrative tasks (Witte 2014:174). Students can communicate with each other and their teachers not only during school hours, but without limitation on time and location. ICT platforms and digital tools allow the teachers create more individualized instructions for the students and to better monitor their progress. On top of that ICT supposedly increases students' flexibility and autonomy and improving their learning attitudes and experiences. All above theoretical pros of using ICT to improve students' educational outcome is strongly supported by additional argument in favour of it: it reduces the education cost in long run (Fernandez-Gutierrez 2020:2).

Questions about the positive influence on students' learning process were and will be raised in many studies, however still many years of research did not bring clear scientific evidence to support this assumption (Wikan 2011b:1). Doubts of good influence of ICT in classroom on students raise with practical daily routines and claimed arguments against use of ICT for education purposes that they may distract students from learning. ICT platforms may help the students with assimilation of knowledge, however ICT when is not strictly controlled by the teachers might undermined the need for work and discipline. According to more criticism, ICT restricts students' creativity, but moreover technologically-mediated relation between teachers and students has it negative consequences from the reduction in human interaction. Educators can explain problem much better than an ICT-platform or even video tutorial, due to individualized approach and being interactive toward existing student's needs. Applications may identify students' wrong answers, but teachers may explain and allow the students to

understand the core of investigated problem (Fernandez-Gutierrez 2020:2). According to Fernandez-Gutierrez (2020:2) schools could experience a positive influence from ICT integration in teaching and administration only if the capability of schools to adapt the organisation and teaching methods were ready enough for the implementation. Also, teaching skills of the teachers in the facility would have to be good enough for effective use if ICT.

Considering all pros and cons of usage of ICT in education, some activities for the teachers and administration are done much more effectively with ICT-based routines, but in some of them the traditional way still has more positives. This means that only good well-prepared strategy based on experience and education can successively implement ICT in school organisation (Fernandez-Gutierrez 2020:2).

Schools as organisations also becoming main users of modern ICT technology not only from teachers' perspective, but also, or maybe even primarily, from school administrators' perspective. The ICT-infrastructure allows school administration to perform administrative tasks effectively and securely for many important purposes, e.g., among others for financial management, or daily organisation in school, e.g., scheduling (Witte 2014:174).

3.2. Digitization, digitalization, and digital transformation

It very important to mark the difference between digitization, digitalization and digital transformation in context if ICT usage. All above terms are widely used in education, however very often they are confused between each other by the readers of articles and even in the organisations.

Digitization is “the process of changing from analogue to digital form, also known as digital enablement” (Gartner 2020a). A good example is when signed documents from previous years need to be scanned and archived in cloud system in an organisation. Many books from the past also need to be digitized to be accessible and survive for the future. In school it could be scanning all students' work and providing them to see in the ICT platform by the teachers or later to the parents (Katu 2022:2).

Digitalization is “use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business” (Gartner 2020b). Digitalisation focuses on implementation or improvement of processes by providing digital technologies or digitized data. This means that digitalisation is an implementation of digital technology for better functioning of an organisation. In school it could be providing students computers instead of buying them notebooks (Katu 2022:2).

Digital transformation “encapsulates the transformational effect of new digital technologies such as social, mobile, analytical, cloud technologies and the Internet of Things” (Gartner 2020c). Digital transformation has a wider term in use toward series of coordinated implementations in organisation. More to explain, it is a series of deep and coordinated culture, workforce, and technology shifts that enable new educational and operating model and transform an institution's operations, strategic directions, and value proposition. In educational sector it could be restructuration of entire strategy and local ICT policy of a school, school organiser or even schools in entire country (Katu 2022:2).

In Figure 2 there is a significant difference between digitization, digitalization and digital transformation.

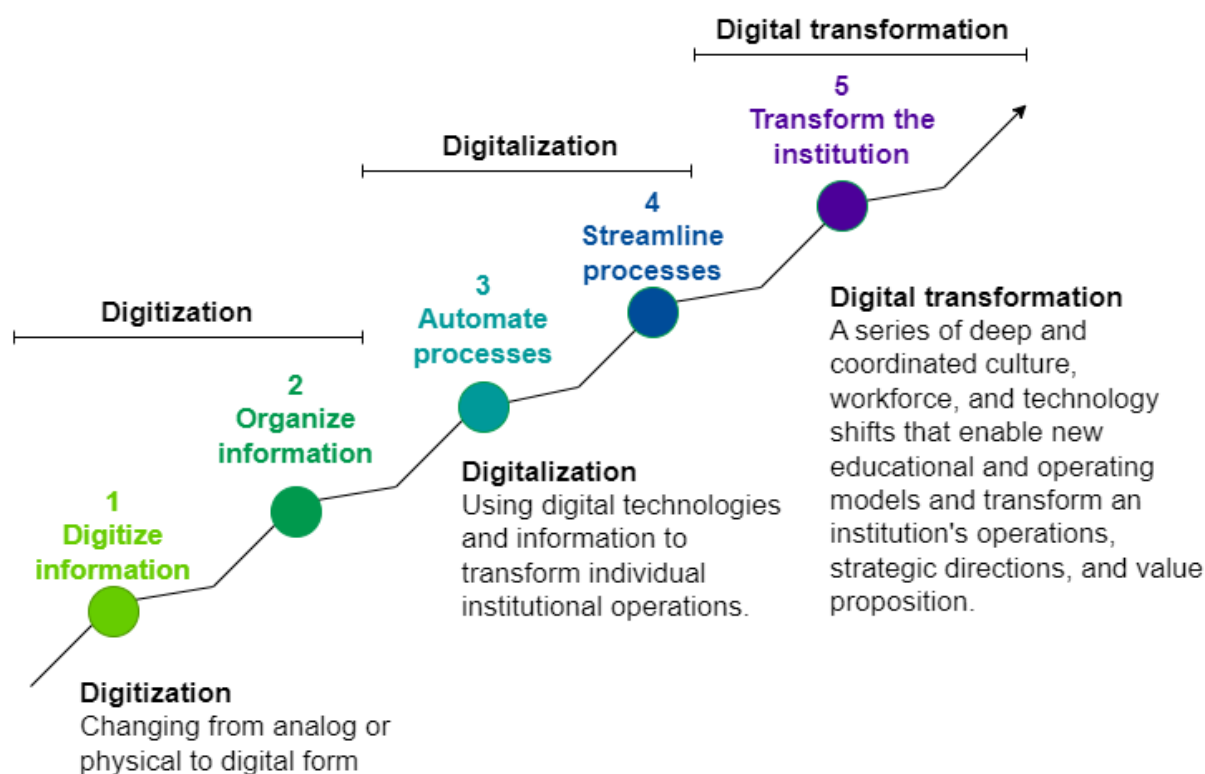


Figure 2: Difference between digitization, digitalization, and digital transformation
Source: Reinitz (2020).

3.3. ICT integration in teaching

Many researchers in the past have shown that teachers usually are reluctant to use ICT in the work, especially teaching in class. According to them, technology in this matter is too complicated and implementation of new processes basing on something that they do not feel comfortable with, feel they do not have enough competence about and might be problematic in general is not a good idea (Wikan 2011a:209). According to Wikan (2011a:209) implementation of ICT in today's school reminds process from the past, when today called traditional methods were implemented – the resistance is similar. Many teachers need to adapt to the new curriculum that is more and more developed digitally. Adaptation requires from the teachers a major challenge: gaining not only technical skills, but also how to pass that knowledge further to the students. ICT in education has the potential to change teaching, however it is not an easy process. Especially when the circumstances in the created environment are not favourable for the teachers to implement innovations (Ghavifekr 2010:38) and require their strong confidence to be successful in performing specific tasks (Hammond 2011:192). Resistance to usage of ICT might be also explained by the teachers not believing that change of teaching strategy on more ICT-related could have a positive influence on the students or even a believe that it would cause a negative impact (Hammond 2011:192). It is important that ICT training for teachers should be not only based on the basic digital competence, but mostly on effective teaching practices with usage of ICT tools and it should be directly related to existing infrastructure, so the teachers could be able to use ICT in their classroom activities (Khaliq 2017:123-124).

There are teachers with different approach to their lessons. Wikan (2011:2) divides them into two groups basing on their vision: student-centred, a constructivist type with a positive attitude towards using ICT in their lessons are and teacher-controlled attitude, more sceptical towards technology in classroom. However, being even being a constructivist encouraged enough to exploit the learning-enhancing potential of using ICT in class is not enough for successful implementation of ICT in school

subjects. For the successful implementation of ICT in the school subjects there are two main requirements to fulfil: teachers must be digitally competent, and they should be able to use ICT as a part of their teaching. These connected requirements have been tried to accomplish by many education leaders responsible to provide support and training to staff. However, there was no significant success in the process. Many teachers pointed out, that they underestimated the challenges of implementing ICT in their roles in school (Wikan 2011b).

According to Wikan (2011b) many teachers feel that courses and training in any area, not only ICT, is useful for them, if outcome from the course benefits their students, when it is later implemented as part of their teaching. This means, that reaching digital competence by the teachers, training in usage of the new applications, programmes and platforms is much more effective, when the results are presented in form how it positively affects their pupils in later stage.

3.4. Use of ICT platforms in school

ICT platforms in school are used in all crucial processes in management, administration, and teaching. According to Witte (2014:174) ICT platforms are used in modern schools for example to collect students' tests scores, monitor progress of students' achievements to their parents, share information among the teaching staff, etc. Those are crucial functionalities for education organisation to work, however a school always focuses on the students – they are the reason for school's existence. Many teachers expect their students to be “digital natives”, as young people live these days close with a technology-driven environment. Students very often are expected to just know how to access the information, understand media creation, technology outcome and finally technology application (Prastikawati 2022:296). According to Prastikawati (2022:297) incorporated e-learning into classrooms matched to the digital era and meets students' expectations and needs. Many schools offer to the students digital learning platforms, which are known by term e-learning. It is a web-based learning system integrating many actors, technology, process for the purpose of giving the full learning experience for the students without the demand for the to be in one location. The use of e-learning platforms started to raise around the world in last couple of years (De Lima 2020:4), especially during and after pandemic of covid-19 (Marchlik 2021:7114). The cause of this is that it offers the educational facilities, teachers and students a flexible, personalized and cheap way to learn (De Lima 2020:4). According to De Lima (2020:4) the main purpose of this is to create communication between users and to facilitate the exchange of goods, services or social currency, thus allowing the values of creation for all participants. This means that e-learning platforms are an additional a way for teachers in schools to give the students possibility to continue work at home after classes and then communicate with the them by the same system. A good example is one of the Google Workspace for Education Fundamentals tools called Google Classroom.

Students benefit from ICT platforms by its availability and accessibility. All learning materials and more possibilities are now it one place, just few click away from the students. Due to those advantages, the students can adjust their learning to their own lifestyle, e.g., missed lessons in school due to sick leave or other activities can now be caught up much easier thanks to school material accessible online (Kozlova 2021:2314). Especially, that according to Kozlova (2021:2314) most students do not lose motivation in compare for traditional learning. Additionally, the students have a little better understanding of the study material and also effectiveness of leaning raises while using ICT platforms compared to traditional methods according to students' perception.

Pandemic of Covid-19 challenged the teachers around the world, when suddenly they had to change their regular stationary teaching to full remote or half-remote education. In many countries the students had to stay home, but compulsory education had to be continued. The only way to provide it was the use of ICT platforms. There were many ICT platforms that the teachers were forced to use for many purposes (Marchlik 2021:7118). Marchlik (2021:2018) grouped the application to four groups:

- asynchronous communication tools (e.g., school website, email, Google Classroom, etc.),
- synchronous communication tools (e.g., telephone, video conferencing platforms: Skype, Google Meet, etc.),
- asynchronous teaching tools (e.g., school website, worksheets, YouTube, ClassDojo, etc.)
- synchronous teaching tools: (e.g., digital coursebook, worksheets, smartboard, Kahoot, etc.)

What is also interesting, the teachers in the time of crisis and huge expectations from schools, parents and students had to step up and quickly gain new knowledge, which they did also by using ICT platforms. According to Marchlik (2021:2019) the teachers used ICT for training, self-help and support. The teachers participated on training courses and webinars to gain required computers skills for further uses in the classes. Due to lack of information and guidance, the teachers started using social medial platforms to find help and inspiration. The teachers that have been forced to rapidly change from teaching in classroom to distance learning during pandemic of covid-19 admitted that their digital competence got better. In result of this Marchlik (2021:7125) states that teachers used to be very stressed using digital tools in classroom before pandemic of covid-19, but after getting knowledge and experience they see that some elements they would definitely like to use in their lessons in classroom. By this the teachers would like to increase the effectiveness of teaching and make the lessons more varied. This example is a significant proof that after beating the resistance from the teachers, the ICT platforms could be seen by them with the right knowledge and experience in using them as a valid tool in their work.

3.4.1. Google Workspace for Education Fundamentals

Google Workspace for Education Fundamentals (GWEF), earlier called G Suite for Education, is an ICT platform provided by Google for educational purposes (Lutfiana 2022:143). According to Brown (2015:160) it is “a suite of cloud-based Google Applications packaged and provided free of charge to educational institutions”. Individually for users, Google provides server based on clouds with limited or unlimited storage with Google Drive with applications that could be used directly to open files in there: Google Docs for word processes; Google sheets for calculations in spreadsheet use; Google Slides for creating presentations. Email services are also included and called as Gmail. Video calls and conferences are possible by application called Google Meet. According to Serrano (2021:4) GWEF provides users “with a collaborative workspace based on the exchange of content and information, by means of communication tools such as chats, email accounts of videoconferences”. GWEF is flexible upon organization’s needs and could be administrated to give the users own accounts with usage of institutional domain (Brown 2015:160).

According to the research made on users, the tools offered by the entire packet is teacher-friendly due to flexibility in terms of working on different file formats. It provides email (Gmail) and collaborative tools for school students. This ICT platform allows the students to work in groups, which is important for students’ cognitive, psychomotor and affective development. From pedagogical point of view, GWEF is appropriate tools for the educators and students, especially it is simply easy to use, according to the made surveys (Lutfiana 2022:143).

GWEF is mostly a number of applications allowing communication between all the actors. According to Sullivan (2022:617) applications in GWEF give the users option to comment their work, which is a perfect solution for the teachers to provide the students feedback for their work and to do not make it public. In a traditional classroom full of students that could not happen, if the students were to present their work in front of entire class. To do it digitally, it is more comfortable for the students. In an often case, when a teacher asks the class if there are any questions in the end of the lesson, this creates much hesitant and many challenges for the students. This simple tool is a great example, how ICT platforms helps to break the barriers. GWEF supports active learning in small groups in an online

environment. Interchangeability between an online environment and school classroom gives the teachers flexibility to work with the students on different levels and continue work with them both: in school and after school, e.g., by homework. By using GWEF as ICT platform, the students collaborate better in groups, the teachers have more options to give feedback to the students individually or to entire group of students and to keep the record of students work. Working in ICT platform gives an opportunity to keep the record of made changes, discussions, and the record of reasoning to support future discussions in groups. Things said in a classroom are not recorded if no one is making notes. With support from the GWEF, that supports saving everything to the files in real time, it is possible to keep all necessary information for further educational purpose (Sullivan 2022:617-618). ICT platform like GWEF use by competent administrators and teachers is in line with concept of collaborative environment to be fulfilled with knowledge, materials, ideas and services to share between end-users (Serrano 2021:4).

3.4.2. SchoolSoft

SchoolSoft is a Swedish web-based ICT platform for administration of school launched for the first time in 2003 by SchoolSoft AB. It offers many functions and modules for different types of school: organized by municipalities or free school organized by private institutions on very different levels: compulsory schools, high schools or schools for adults (SchoolSoft.se 2022). According to the producer, there are 830 000 users and 2000 schools actively using SchoolSoft (SchoolSoft.se 2022). SchoolSoft is an ICT platform for the purpose of communication between school, students and their guardians (Gotland.se 2022).

SchoolSoft stores all schools' data on its own servers and allows synchronization with many other ICT platforms that schools might use, e.g., scheduling programs, Google Workspace for Education Fundamentals or other IT solutions dedicated to educational institutions. This allows automated process of data between different ICT platforms, but not all that particular schools use, e.g., there are differences in frequency of data synchronization, which might be not effective at all in practice or sync might be simply not possible as a solution for a particular ICT platform (SchoolSoft.se 2022). All depends on setting that particular school chooses and how it is administrated by responsible members of staff.

Teachers use SchoolSoft for planning (daily, weekly and yearly) with usage of placed in the system knowledge requirements in all subjects from Swedish curriculum, where ideally everything is set for promotion of transparency for the student and their guardians. SchoolSoft is a tool to provide the students with feedback from their teachers: to show them current situation and what they should do in the future with help of official materials and knowledge requirements from The Swedish National Agency for Education. The platform is flexible for the schools and gives the possibility to create own forms and templates, which is adjustable for the purpose of own perception of the curriculum, learning plans, and pastoral strategies (SchoolSoft.se 2022). According to the ICT platform provider's official website SchoolSoft.se (2022) progress of the students is recorded and used also by their mentors and school leaders to provide guide to the students and their parents for students' progress in different subjects or overall situation in school. On top of that the parents can get the picture of they children's days in school by reading daily and weekly planning given by the teachers. Important feature of SchoolSoft is to keep reports of students' absences in school, which is a base for the municipality's accountment and also child services in case of lack of compulsory schooling by individual students. SchoolSoft give the opportunity for the school to inform parents about everything: all important and not important happenings in the institution.

3.4.3. Behaviour Watch

Behavior Watch is a British ICT platform to monitor students' behavior in school by creating a database of comments made by teachers and other school employees. According to the Behavior Watch provider "it allows teachers to efficiently reward positive behavior while carefully planning interventions to

amend problematic pupil conduct. The suite of tools available empowers staff, with services such as the advanced reporting system, setting the new standard for internal school data. Compiled in a custom-built interface, BehaviourWatch is capable of restructuring dysfunctional schools and taking adequate schools to the next level” (EduSpot.co.uk 2021).

The platform gives the school possibility to synchronize with school management information system, however it requires correct administration. It is also flexible enough to build the system around school internal policies. As output the ICT platform gives the information to the users: school management, teachers and administration about patters in students’ behavior that is earlier registered by teachers in their judgement about the incidents in school, e.g., how weather affects the students in terms number of pastoral problems assigned to them individually. According to the platform provider, it allows to notice trends, understand behavior and later plan interventions. On top of that, the system allows to communicate with staff and parents (EduSpot.co.uk 2021).

The ICT platform belongs to EduSpot, a company that joined Community Brands in 2017 - a family of purpose-driven, cause-focused, market-leading technology solution companies in Great Britain (EduSpot.co.uk 2021). Unfortunately, there is no research made on usage of this ICT platform yet.

3.4.4. Happeo

Happeo is an ICT platform working on a rule of intranet that companies use to connect growing teams with the information, news and other tools for the purpose of better communication. According to the ICT platform provider “an intranet can be defined as a private network used by an organization. Its primary purpose is to help employees securely communicate with each other, to store information, and to help collaborate. Modern intranets use social intranet features that allow employees to create profiles and to submit, like, comment, and share posts” (Happeo 2023).

According to the developer benefits of using Happeo by different companies are to have ongoing access to organization data and files, which are stored securely, increase internal communication, increase employee productivity, motivate employee to engage into information flow, enhance collaboration, encourage share of knowledge. Additional feature of this ICT platform is to integrate with others, which requires attention from school administration.

3.5. Conceptual model

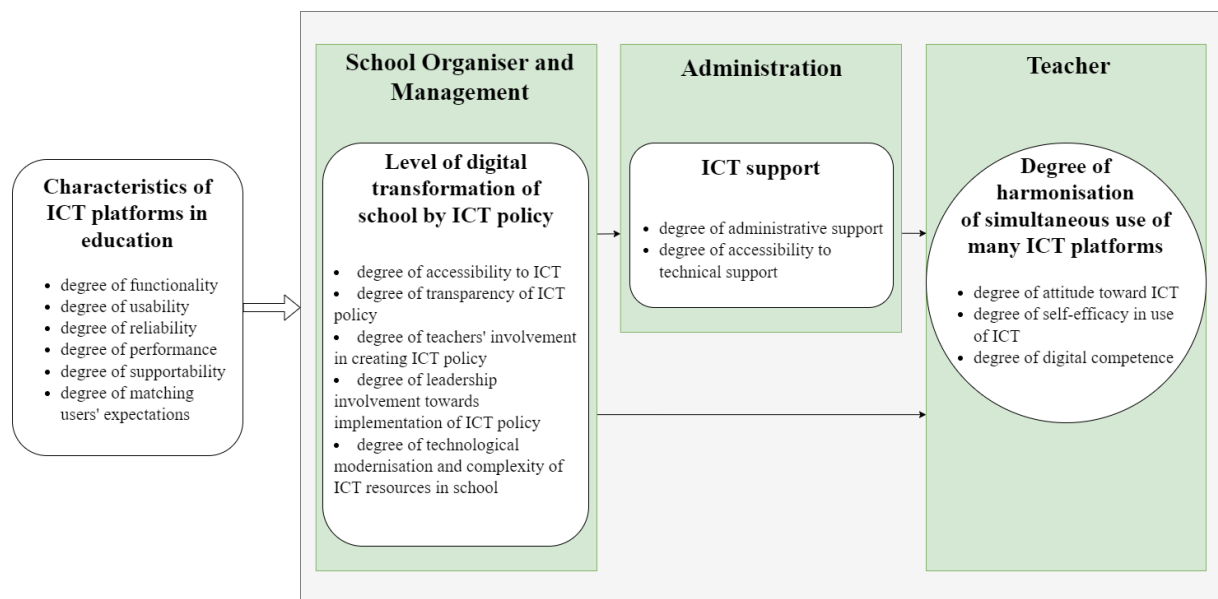


Figure 3: Conceptual model of factors influencing upper school teachers' degree of harmonisation of simultaneous use of many ICT platforms
 Source: Modification of Basak (2015:435), Eriksson (2008:42), Seifu (2020:4), Wang (2022:512).

3.5.1. The conceptual model in its entirety

Based on the literature review, the conceptual model contains the most important actors and variables that affect and contribute to degree of harmonisation of simultaneous use of many ICT platforms from upper school teachers' perspective.

The conceptual model shows the main actors in this bachelor thesis in Information systems: School Organiser and Management, Administration and Teacher. The independent variables and their associated indicators have been identified based on the literature study. For the actor School Organiser and Managements there is Level of digital transformation of school by ICT policy chosen as the independent variable. For the actor Administration there is ICT support chosen as the confounding variable. For the actor Teacher there is Degree of harmonisation of simultaneous use of many ICT platforms chosen as the dependent variable. There have been also identified an independent variable Characteristics of ICT platforms in education. The influence arrow from the Characteristics of ICT platforms in education to the relationship between all three actors shows that if indicators in the characteristics of Characteristics of ICT platforms in education are present to a higher degree, they have a positive impact on all three indicators for all three actors School Organiser and Management, Administration and Teacher.

Independent variable Level of digital transformation of school by ICT policy for actor School Organiser and Management has identified indicators degree of accessibility to ICT, degree of transparency of ICT policy, degree of teachers' involvement in creating ICT policy, degree of leadership involvement towards implementation of ICT policy, degree of technological modernization and complexity of ICT resources in school.

Confounding variable ICT support for actor Administration has identified indicators degree of administrative support and degree of accessibility to technical support.

Dependent variable Degree of harmonisation of simultaneous use of many ICT platforms for actor Teacher has identified indicators degree of attitude towards ICT, degree of self-efficacy in use of ICT and degree of digital competence.

Independent variable Characteristics of ICT platforms in education have identified indicators degree of functionality, degree of usability, degree of reliability, degree of performance, degree of supportability and degree of matching users' expectations.

3.5.2. The conceptual model variables

Characteristics of ICT platforms in education

Teachers in school have requirements for the hardware and software they are forced to use by the organization on the base of human's perception of ICT platforms. According to Eriksson (2008:43) there are five of requirements for applications and additionally restrictions for the design, which for the purpose of this study can be called as "matching users' design expectations".

Functional requirements describe what system, in this case ICT platform, can do (Eriksson 2008:43). For example, if a teacher is expecting that an ICT platform is supposed to have spellcheck, then the functionality of the ICT platform will be assessed from the perspective if spelling is actually checked by the application. That is why *degree of functionality* is the indicator for the functionality of ICT platform.

None-functional requirements are supposed to describe how the system, in this case ICT platforms should work. There are four categories of none-functional requirements.

Usability describes how easy it is to learn and use the ICT platform if the ICT platform is easy to receive help with by looking into documentation or guide (Eriksson 2008:45). *Degree of usability* can show how the knowledge of usage of ICT platform is easy to absorb by the user.

Reliability is a factor describing if the user can depend on the ICT platform even with many hours of usage without errors with consequences for the user (Eriksson 2008:47). *Degree of reliability* shows how ICT platform is error-free for the users, so they can work without unpleasant and frustrating surprises.

Performance expectation from the user is how quick the ICT platform reacts on the users' command (Eriksson 2008:49). *Degree of performance* is the indicator of quickness on users' demand.

The requirement of supportability is important for the administrator of the ICT platform because it describes how it is cheap and easy to maintain (Eriksson 2008:50). Degree of supportability is the indicator for level of how ICT platform is economically worth and easy to administrate in case of needed changes, adjustments or errors.

Degree of matching users' design expectations is how the ICT platform's interface is user-friendly according to users' expectations. According to Eriksson (2008:53) there are design restrictions for the ICT platform developers, for example a specific programming language has to be used. However, from user perspective what matters is how the platform function on a certain operating system or how it looks like to find looked option and modules that the ICT platform offers.

Level of digital transformation of school by ICT policy

In line with school digitalization and implementation of complexed ICT platforms it is relevant for school leaders to have adequate digital competency. It is required for school leader to lead strategically for digitalization and pedagogical development. School leaders need to consider how to steer or support the use of digital technologies (Håkansson Lindqvist 2019:219-220). School Organiser and Management are policymakers for the organization in terms of ICT. Teachers and school administration depend on their decisions and documents for steering effective strategy for ICT. Building of effective IT infrastructure in school could be challenging, however it is indisputable condition for integration of ICT in education. Teachers that are told to use specific ICT platforms need to have access to computers, updated software and hardware. Their teaching with usage of ICT depends on *degree of accessibility of ICT* (Seifu 2020:3).

Leadership is a necessary element for ensuring the balance between important element for implementation of ICT policy in school through support and collaboration. School Organiser and Management could make ICT policy more transparent to the teachers, which allows the teachers to organize the teaching and learning process more efficiently. The *degree of transparency of ICT policy* is important factor for teachers' work with ICT platforms (Wang 2022:511).

According to Wang (2022:512) the role of leadership has been identified as a key element related to the level and extent of ICT policy implementation. There are many factors influencing integration of ICT and use of ICT platforms in teachers' role in class and their administrative part of their work (e.g., grading, marking, contacting parents, etc.) concluded by research. There are personal, technological, and institutional factors that highly influence the entire process (Seifu 2004:3). School Organiser and Management is fully responsible for *degree of leadership involvement towards implementation of ICT policy* in school.

The effective and efficient use of ICT in general and ICT platforms requires effect from School Organiser and Management when it comes to involving teachers and developing a shared vision. Therefore, *degree of teachers' involvement in creating ICT policy* depends on the School Organiser and Management' approach to collaboration with the teachers (Wang 2022:512).

Characteristics of technology determine the use of ICT platforms by the teachers. There is evidence that innovations implemented by the schools' support integration of ICT in schools by the following attributes: relative advantage, compatibility, complexity, trial ability, and observability as perceived by individuals (Seifu 2020:3). Degree of technological modernization and complexity of ICT resources in school depends on School Organiser and Management's plans for restructuring and ICT integration. It can be seen as complicated and multifaceted. It is characterized by dynamically interacting elements such as access to infrastructure, the acquisition of ICT platforms, knowledge of integrating technology with curriculum and access to technical and administrative support. School Organiser and Management are not only involved in the purchase of resources, but in this case they are responsible for it (Wang 2022:511). By planning, purchases and implementing the infrastructure School Organiser and Management is responsible for *degree of technological modernization and complexity of ICT resources in school*.

ICT support

Researchers found out that administrative support positively affects the process of integration of ICT in teaching. Administrators supposedly should share their tasks with subordinates while focusing on the integration – all influenced by a proper technology leadership. *Degree of administrative support* stimulates the integration of ICT in teaching and use of ICT platforms by teachers (Seifu 2020:3).

All staff, teachers and students should be able to receive technical help in usage of ICT for the best experience of usage of the tools. According to Seifu (2020:3) repairing contributes for the integration of ICT in teaching-learning process. The most important reason for this is that failures and errors without proper fast reaction and repairment create frustration among users. Teachers need technical support in school to integrate ICT and ICT platforms in their teaching, that is why *degree of accessibility to technical support* has significant influence on teachers in school (Wang 2022:512).

Degree of harmonisation of simultaneous use of many ICT platforms

Usefulness of technology is the first perimeter dictating if an organization requires digitalization and it is similar with integration of ICT into teaching. Seifu (2004:3) writes that acceptance by the teachers is needed to create the right attitudes and belief to use ICT technologies in class. To be able to use ICT in teaching, learning and administration there are many applications offered to schools, education leaders and finally teachers. Usually, teachers are forced to base on applications and systems bought and implemented by their school, which determines that they need to adjust their own experiences,

competence, and practices to the place, not the opposite. Teachers' positive attitude towards these can easily provide useful insight about the integration of ICT into teaching and learning processes. Teachers' attitude and an inherent resistance to change together with attitude towards technology and resistance to organizational change and resistance to outside intervention are factors affecting teachers' successful adoption and Implementation of ICT in teaching and learning (Basak 2015:435). This means that *degree of attitude toward ICT* entirely influences use of ICT platforms by teachers in school.

One of the major factors affecting the use of any ICT by teachers is their digital competence. Research has shown that it is a key to effective use of ICT by a teacher, which is connected to possibility of using any technology or application in relation to teachers' role (Seifu 2020:3). According to Suárez-Rodríguez (2018:1167) teachers' competences in ICT may change their teaching practice since teachers are a very important aspect of integrating ICT in classrooms. Teachers to feel confident about using ICT must consider technological and pedagogical components because both are essential for use if ICT. The most influential factor in teachers' competences in ICT is use of ICT for administrative work in teacher's role, for example preparing lessons, marking students' work or any other activity with ICT without students present in the classroom. This means that teachers without adequate ICT competence might not experience big problems during lessons, but other activities for the teacher that are required by the school with use of ICT could be a significant issue. To prevent that, ICT is important part of initial teacher training (Suárez-Rodríguez 2018:1183). *Degree of digital competence* is the indicator for how a teacher is educated and trained in technologies, more specifically for this context, using ICT.

According to Hatlevik (2018:2) teacher self-efficacy is about teachers' beliefs that they are capable of carrying out good teaching in the classroom. The same definition applies for the teachers' self-efficacy in use if ICT. Teachers' self-efficacy is inseparable with teachers' competence in the area. Lack of teachers' confidence, fear of failure and teachers' anxiety about ICT knowledge on top with lack of self confidence in ICT are factors affecting teachers' successful adoption and implementation of ICT in teaching and learning (Basak 2015:435). According to Seifu (2004:3) teachers' self-efficacy affects the use of ICT in teachers' role, which is described by *degree of self-efficacy in use of ICT*.

4. Results

In the chapter "Results" there are presented the most important primary empiric data from the interviews with the chosen respondents. The semi-structured guides for the interview (see Appendix 2) were designed from the conceptual model (see figure 2). In table 2 are presented answers from upper school teachers to questions regarding degree of harmonisation of simultaneous use of many ICT platforms. The protocols from the interviews with Teacher 1, Teacher 2, Teacher 3, Teacher 4 and Teacher 5 are available in Appendixes 3, 4, 5, 6 and 7.

Table 2: Primary empiric data from Upper School Teachers in Internationella Engelska Skolan Tyresö

Variable	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Teacher 5
<i>Characteristics of ICT platforms in education</i>	<ul style="list-style-type: none"> • We receive a mobile phone and a Chromebook from the school. • There is no possibility to upgrade devices individual as a teacher, but there is as a department. • The students are not provided with any devices. • If you are not used to ICT platforms it creates more job, because you need to figure out how they work. • Interface while using one ICT platform is not a challenge. • The more platforms you use, the more twerks and tricks there are that you don't know about. So if that was just one platform, it would be a bigger chance for you to know. • Features that are active in ICT platforms, but I do not use them do not disturb me. • I use GWEF to write feedback and later I paste it to SchoolSoft due to lack of needed feature in SchoolSoft. 	<ul style="list-style-type: none"> • Teachers are provided with a Chromebook and a smartphone. • I am not sure if the teachers have the opportunity to upgrade hardware in school. • I do not know who chooses the type of IT equipment in school. • The students are not provided with any computers, but they can borrow Chromebooks. The students use Chromebooks that we have in trolleys. • SchoolSoft is ineffective in many ways. • I avoid active features in ICT platforms that I do not use by learning to do not see them. • I would choose to use more apps if that could expand my possibilities 	<ul style="list-style-type: none"> • We received Chromebook and phones from the school. • No, I do not think we have any opportunity to upgrade the hardware. • The students are provided with computers from the trolleys when a teacher books them. There is a limited number of them. There not enough for everything in the school. • There are too many links in ICT platforms that we don't use. It gets confusing. If you have done it couple of time it is not less annoying, but at least you know where to find it. • Features of the ICT platforms that you do not use, but they are still active make me wonder why those features are there. It makes me uncertain if there 	<ul style="list-style-type: none"> • We are provided with a school computer and a school phone. • Student who have different diagnosis they can get one on one computers, but not every student in school has one. There are a number of computers that teachers can book for lessons. Where student can have one on one computer for a certain hour when they do a certain project. • Usually when I know how a certain ICT platform works, I can do what I need to do, but if it is a new platform that I have never been on, that I am just exploring. I would have to do some work over the weekend. If it is a new and different 	<ul style="list-style-type: none"> • In school we are provided with a Chromebook and a phone. • The students are able to use Chromebook when a teacher books them in advance. not every student has the access to a computer in every lesson. In music department we have iPads for students in use in music lessons. • Differentiation of interface in the ICT platforms frustrates me a lot. The reason for this is when I do not know something. Especially the ICT platform that frustrates me the most is Happeo. There are so many questions: where is the information only for IES Tyresö, where is the information that is

	<ul style="list-style-type: none"> • I would choose to use more ICT platforms to expand my possibilities, if that could benefit me as a teacher and my students. Especially pedagogical tools. It is the admin ICT platforms that are the issue, because they add workload. • It is the screen on the device that is the biggest problem while harmonizing usage of many ICT platforms. My Chromebook has a 14 inches screen, some teachers have even smaller screens. Because connected to the ICT platforms and having all the tabs and can you imagine you sit with this tiny Chromebook and you have SchoolSoft and then you have your excel sheet and you need to keep track, so you enter the right grade and it is a tiny little box. Some of my colleagues sit with a big gaming monitor to manage that. Having a bigger screen would significantly help with moving between many ICT platforms. 	<p>and it could benefit me as the teaches and my students.</p> <ul style="list-style-type: none"> • Google Classroom, Google Slides and Google Docs are the apps that I use the most in teaching. • Everything is already in SchoolSoft in terms of assessment in context of new curriculum. It is an administrative support that everything is there. • According to the curriculum it could be a paper and a book and you never need to have a computer. It is our policy that tells us to work in a certain way. The way to mark it in SchoolSoft matrix system that is just the platform design. 	<p>is something that I missed or not.</p> <ul style="list-style-type: none"> • I would like to use less ICT platforms in my teaching, but with more variety. • I would like to go back to training to properly understand the ICT platforms that we use now, e.g., GWEF. • It has become more complicated now with new curriculum since they are all lumped together. Now we click the box, it is already there, so if you say knowledge requirements, you click the corresponding box, but before it was broken up to different sections. So now I click one box that has four different sections and if I test only a small part of that, I also need to go and copy that somewhere and paste it to the description. Before it was also translated into English. Now it is not. So we have a separate 	<p>looking platform or it is a brand new platform to me, I would definitely need to take some time on my own to figure out before I would feel comfortable maneuvering through.</p> <ul style="list-style-type: none"> • Features of the ICT platforms that I do not use are additional places to get lost. • The curriculum, especially the new one, has bigger focus on technology for sure. They want students to be more familiar with technology because it is an important thing. The even added a technology class and a lot of math curriculums now in the end of the year are supposed to be two of three weeks coding, a unit that students are supposed complete as week. If you are not using ICT 	<p>for all of IES? It is very confusing; it is a bit of a jungle. It is because they need to take some time on my own to figure out before I would feel comfortable maneuvering through.</p> <ul style="list-style-type: none"> • Features of the ICT platforms that I do not use are additional places to get lost. • The curriculum, especially the new one, has bigger focus on technology for sure. They want students to be more familiar with technology because it is an important thing. The even added a technology class and a lot of math curriculums now in the end of the year are supposed to be two of three weeks coding, a unit that students are supposed complete as week. If you are not using ICT • Features of the ICT platforms that you do not use, but they are still active are not a problem, when I know what I am doing. • In my lessons I use the following ICT platforms for teaching: GWEF, Google Slides and Google Docs. Also in music I use YouTube and Spotify quite often. • For planning and assignments curriculum is already placed in
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	<ul style="list-style-type: none"> •I am frustrated about how the curriculum actually does not fit well with SchoolSoft adaption. •Curriculum doesn't forces me to use SchoolSoft, it is IES that forces me to use SchoolSoft. And the way it is set up to give feedback. 		<p>document in different ICT platform, where we have our grading criteria translated to English and that is the one that I use to copy and paste.</p> <ul style="list-style-type: none"> •Using ICT platforms in my lessons is part of core content in curriculum. We are expected to help students to allocate different ICT platforms. 	<p>platforms, when you are teaching students, they I feel like you definitely you are doing them a disservice.</p>	<p>SchoolSoft, so we just need to check boxed. Then you can find both the central content and the knowledge requirements.</p> <ul style="list-style-type: none"> • I tend to copy and paste them in an old-fashioned way to inform the students in a better way. • Curriculum does not force me to use ICT in my lesson. I could run a music lesson without anything. It is my choice to lighten up teaching and use it. I do have a lot of lessons, when I don't even turn the projector on due to nature of the subject.
<p><i>Level of digital transformation of school by ICT policy</i></p>	<ul style="list-style-type: none"> •I was informed about ICT policy at my first new staff introduction, digitally, and also nano lessons. •I receive information about current ICT policy in all staff meetings every week and emails. 	<ul style="list-style-type: none"> •I was informed about ICT policy in school from training sessions, mouth to mouth from by colleague, all staff meetings, and emails. •ICT policy and routines are updated every term. 	<ul style="list-style-type: none"> •I was not informed about ICT policy in school. A lot of this was a trial and error. That was because I started in the middle of the year. I had to find my own way through SchoolSoft. I 	<ul style="list-style-type: none"> • When I first started it was the IT representative who introduced me to ICT policy. He gave us tutorials how to run different ICT platforms. And from there it is just 	<ul style="list-style-type: none"> •I received information about ICT policy in school from training sessions. •Onboarding process in terms of receiving information about ICT policy was random and

	<ul style="list-style-type: none"> • I do not know how often the ICT policy is updated. • I can only expect students to check things like SchoolSoft and maybe information in Google Classroom. I can't really expect them to use Google Classroom. Google Classroom is an additional tool if we do provide devices. • We use SchoolSoft, which is the demand for admin part, keeping track of attendance, and assessments, grading, communication with students and parents. We have Google Workspace for Education Fundamentals, with applications: Google Classroom, Google Docs and Google Drive. We have to use Behavior Watch. There are also other ICT platforms: Goosechase, Kahoot, Citera, National Encyklopedin, I am actually using Skola24 a lot, because the schedule view is much easier than SchoolSoft to see schedules than SchoolSoft. We have books digitally for 	<ul style="list-style-type: none"> • I receive a Chromebook and there are the things downloaded on Chromebook automatically and everything is there. • In the lessons students use Chromebooks that teacher borrow for the class and outside the lessons they use their own devices. They can log in to SchoolSoft and Google Classrooms. • I use Happeo to find things that I need as an employee like everything from leave of absence or any forms and forms for academic action plan is in there. SchoolSoft, I use for weekly planning, to create assignments, mark assignments, to grade, assess assignments, and give feedback. In SchoolSoft I look up groups of students to find phone 	<p>received help from other teachers in my department.</p> <ul style="list-style-type: none"> • Usage of our ICT platforms is a very simple thing to teach people if we had some sort of a course. • Students in school receive a possibility to use computer during the lessons on demand of a teacher. Outside the lesson we assume they all have a computer or phone at home connected to internet. • At work I use the following ICT platforms: Google Workspace for Education Fundamentals: Google Sheets, Google Slides, Google Classroom, YouTube. SchoolSoft, Behavior Watch, Happeo. Hogia once a month. • I need to place the same information many times to different ICT platforms every time I updated weekly planning. I have to post it to several different ICT platforms. This is 	<p>the longer you work, you learn from your department usage of ICT platforms.</p> <ul style="list-style-type: none"> • I use SchoolSoft for recording students attendance, contacting parents, storing contact information I needed, weekly planning. GWEF: Google Drive that is just Google Slides, Google Sheets and that is just for lesson planning. Behavior Watch is that to monitor students' behavior. Happeo that is more to record students behavior, student progress. Hogia that is where I look at how are my absences and payslips. • We double dosing the students with information in different ICT platforms. At least once a week I have to place the same 	<p>not very organized. It was on a "need to know" basis.</p> <ul style="list-style-type: none"> • The students get access to computing only when we book computers. • I use the following ICT platform at work: SchoolSoft for planning, attendance, contact with parents, grading, so kind of day to day stuff is SchoolSoft. GWEF for planning lessons and all documents. Behavior Watch for the behavior, mentor contact. Happeo for searching for administration and documents. In music lessons YouTube and Spotify. • Then my actual lessons plans, nitty-gritty lessons that happens on Google presentation and document side of things. Then Behavior Watch for the behavior, mentor contact, login. Happeo is
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	<p>teaching subscription, so I use that a lot too. Eduscobot, Hogia.</p> <ul style="list-style-type: none"> • I place the same information many times to different ICT platforms mostly in SchoolSoft, especially when I do weekly planning. Also, when I need to give the students feedback. Also, when I need to look at schedule in Skola24 and do attendance in SchoolSoft. 	<p>number and email addresses to parents and I check attendance in SchoolSoft. I book computer trolleys, I book times for parent meetings: development talks, and sometimes I check lunch menu. I use GWEF: Gmail where I communicate with colleagues, management, parents and students. I also use Google Calendar, Google Classroom, where I put some work for students sometimes. I also use Google Meet. I use Behavior Watch, where I create behavior notices for students.</p> <ul style="list-style-type: none"> • I need to place the same information many times to different ICT platforms every single day, even couple times a day. It affects my lesson and is extremely energy-consuming. 	<p>frustrating. The students are confused with current information flow.</p>	<p>information many times to different ICT platforms.</p>	<p>for I supposed day to day when you look for admin things and documents are there. Of course, YouTube, Spotify for me as music teacher.</p> <ul style="list-style-type: none"> • Reasonably often I need to place the same information many times to different ICT platforms. Especially for of my lessons. There is a lot of cross reference to make sure that everybody has the information they need for everything.
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ICT support	<ul style="list-style-type: none"> • Technical support works well. When there is an urgent problem then I call, but normally I send an email. Responses are quick. 	<ul style="list-style-type: none"> • I notify about a problem by email. The response is very fast. I am notified about ICT problem in entire organization if this occurs. • I receive sufficient administrative support from head of my department. Every platform has a person responsible in school. 	<ul style="list-style-type: none"> • Technical support is very good. I think our IT representative usually fixes a problem in under an hour. • The current functionality of ICT platforms is simple, however the routines around that are confusing. • The process of onboarding the new teachers is unclear. 	<ul style="list-style-type: none"> • If I have a technical problem, then I call or I email IT representative. Help comes fairly quick. 	<ul style="list-style-type: none"> • IT representative is responsible for technical support. He also orders the IT equipment. • I notify about problems with ICT by email, unless the internet does not work, then I send a text message to IT representative, or I call. • The technical support is reasonably good.
Degree of Harmonisation of simultaneous use of many ICT platforms	<ul style="list-style-type: none"> • I am a good quick learner. I am used to adapting to new digital tools, but I have no specific ICT training. No ICT training at university. • Learning how to use ICT platforms is by receiving just general instructions and later only practice. 	<ul style="list-style-type: none"> • My personal interest in ICT is Medium to lower medium. I am not very interested in technology. • There was not any ICT training in my university studies. 	<ul style="list-style-type: none"> • I am confident how to use the basics, but not how to use them smartly. I don't know if I have enough knowledge to be able to figure out everything that the ICT platforms can do. • At university we did loads of computers skills at 	<ul style="list-style-type: none"> • Level of my digital competence is very low. I am not very good with computers. I know how to use the programs that I need to use to do my job. • During my education degree there was not 	<ul style="list-style-type: none"> • In terms of my personal interest in computer technology and level of my digital competence I don't rate myself very highly. I have learned all the things that we need to use for work. I don't take particular

	<ul style="list-style-type: none"> • Some of the requirements are more focused on admin tasks rather than helping and giving feedback that has a pedagogical result for the students. My biggest issue is SchoolSoft an how it works with the new curriculum and giving feedback to students. For me it is double work. SchoolSoft creates more work than helps. • In GWEF, app Google Classrom it is possible to give feedback, comments that actually the parents can access. When I give feedback it is accessible for students to see. But not in ShoolSoft. • I would say my biggest clash that is creating double work is actually the teaching platforms which is Google, Google Drive, Google Classroom and then a separate platform SchoolSoft for giving feedback. • When you want to use more ICT platforms, the more challenged you are. As long you are in the bubble of one provider, everything works good. 	<ul style="list-style-type: none"> • ICT training at my workplace was provided by someone here, for instance the IT representative, first teacher, or head of department, coordinators going through the basics of platforms: SchoolSoft and Behavior Watch. Training about the technology itself was offered but didn't do it. • Usage of ICT tools is not that is not stressful for me. • I have administrative difficulties to use ICT platforms. Due to the number of them I tend to forget to fulfill my responsibilities. • The number of routines combined with the number of ICT platforms used in school make my life much more complicated. Giving feedback to 	<p>school and then we did computer training at university as well, how to use key words and source criticism. And then at my first school we had Excel quite a lot, because we used it at school that I worked at.</p> <ul style="list-style-type: none"> • In using ICT platforms still challenging for me is to keep track of where I have to put what data. • It is a little bit annoying that you can't just rely on one platform to be able to manage with all the things associated with teaching and school. • My workload increased since we move to the new curriculum, which affected SchoolSoft. Subject rubrics or grading criteria now have been squished together, when before there were broken up to different sections, which means that I can't rely on SchoolSoft to do 	<p>much computer training at all. When we started working in a school they taught me how to use the systems that were supposed to be using. Later my job, when I started working at IES Tyresö, again we had another introduction to SchoolSoft.</p> <ul style="list-style-type: none"> - I have problems with GWEF: Google Slides and Happeo. Due to this, things that should be done quick take more much longer time. - Administration tasks take me much time. It is stressful to find information that I am looking for in the ICT platforms. - Most of the time I feel confident with using ICT platforms, but it happens that I feel lost. • I would like to expand my competence after work withing ICT, 	<p>enjoyment in it and quite often struggle a little bit.</p> <ul style="list-style-type: none"> • In university I did not received much ICT training. We were tutored how to use word programs how to handle our work. • I received courses required for secondary teaching. • Almost everything is still challenging for me to cover in terms of using ICT platforms. I find it very hard to find the data I want. I know exactly what I need, but then I don't know how to get it. It is a mix: how it is complicated and number of ICT platforms. The problem is, because they are all different. • The number of ICT platforms affects how much time I spend on my administrative tasks.
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	<ul style="list-style-type: none"> • Admin workload takes a lot of time away from the teaching and preparation and actually for me it takes more time use the ICT platform, than write feedback on the test. If I could just take the test and write feedback and that is enough, it would be done. So it has become stress factor for me and it is not assessing the test, it having the pressure of putting it in the admin system. It is like ticking the boxes, formulating yourself, it is that you don't have the actual test there, so how can the kids are supposed to understand your feedback without seeing their test? How can the parents understand the feedback without seeing the test? • There are a lot of shortcuts to take in ICT platforms that I still do not know about. It is a lot of learning from your colleagues. • I think the major challenge is the teaching platforms are separated from SchoolSoft. And then of course you have Behavior Watch, but then you keep an eye 	<p>students and sharing it with students and parents creates complication with choice of the right ICT platform to do it. Also, depending on which department the teacher belongs, the routines are different. There is no one system for all teachers in school.</p> <ul style="list-style-type: none"> • I keep the minimum tabs open and I treat them as "to do list", but it tool me a while to figure out this system. • I use a very small percentage of all the options in each platform. • Using ICT platforms become more difficult, when I suddenly loose access to different parts of the system. • While using ICT platforms things sort out themselves in a way it is workable. 	<p>my grading, because it is not settle enough. I use spreadsheet in a separate ICT platform to cope with this.</p> <ul style="list-style-type: none"> • I have a strategy to have a hard copy of a document and compare with data in different ICT platforms, for example putting grades. • It is tough to keep track what you are doing where in terms of many ICT platforms. It is doubling the workload to use many ICT platforms. If you have too many tabs open it is easy to miss something. Keeping track of what you are doing and where you are doing is becoming more complicated. • I would love to expand my ICT competence after work. I also suggested that to school leadership. I would like to know how to help students' parents with ICT. 	<p>because IT is becoming more important and I feel like I am not very good at it.</p> <ul style="list-style-type: none"> • I would like to expand usage of ICT platform in my lessons to have a fun lesson sometimes. Student need variety from time to time. It is good to have fun and get the students to engage with not academic work. There is 5 or 6 times in a term. Maybe 10 times in the whole year. • I get insight about new ICT platforms during professional development days or conferences with teachers from other schools. So sometimes I write them down or send email to myself and I can check them up on the weekend and see what they are like. 	<ul style="list-style-type: none"> • Working with many ICT platform on my device is quite chaotic. I have many tabs open at the same time. Working on many ICT platforms and switching between them frustrates me mostly. • Using many ICT platforms makes me really annoyed. It does disturb me and it does take concentration away. I think the biggest thig for me is then I start double checking everything. • I would like to expand my competence within ICT in problem solving. .When things go wrong, and something doesn't work I am completely clueless. • Expanding the usage of ICT platforms un my lessons would be good. I do not think a am making the best use of the ICT platforms at all.
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	<p>on mentor students' attendance and so on in SchoolSoft, but that is not as time consuming as the teaching clash. Of course, I wouldn't say I lose focus, but it adds stress.</p> <ul style="list-style-type: none"> • I am more interested in platforms that are flexible that can help me in teaching, such as Google Classroom and Trelson and how to communicate with the students. • I am not able to use ICT platform to teach due to limited accessibility of hardware for students in school. • I am more frustrated on using ICT platforms that we have now in school than searching for new ones. • You start to realize how many ICT platforms you are actually using and how do I find out about it is normally from colleague. It is not something that stresses me, but everything time you are taking a new platform, even if it is a colleague that you find out from, of course it takes more time to 	<ul style="list-style-type: none"> • It would be great to have features from many ICT platforms in only one. The number of ICT platform is frustrating, and it affects me. It affects all teachers also in the moment when new staff arrive, because we have to teach new people. It takes more time and energy. • I wouldn't like to expand my ICT competence outside work. I it the platform designer should work on ICT platforms being user friendly as much as possible instead of asking the user to learn, unless I am using something that is more complexed. • I would like to use less ICT platforms in my teaching. • Due to the number of different ICT platforms 	<ul style="list-style-type: none"> • It would be great to implement more ICT platforms in my teaching, but the students do not have enough digital competence. • Kids in Sweden have less knowledge of how to work with computers. We think they are digital natives, because they grow up with social media, but they don't know how to put a word document into columns, and they don't know how to write with appropriate font. • The number of different ICT platforms on the market does not affect my lesson planning. I rely on Google Slides. • I do not check the new available ICT application on the market. I use only what I am told to use. • Placing all ICT platforms that we use in the school into one with all necessary 	<ul style="list-style-type: none"> • I am not super familiar with all the platforms, but I definitely know that there is lots of different platforms or there is lots of different things that are making schooling in general a lot easier for students. • Placing all ICT platforms that I use in the school into one with all necessary features would be a huge mess. It might be quicker to access certain things, but I definitely thing the would be a learning curve. It would take some time to figure it all out, because it could end up being a huge mess. 	<ul style="list-style-type: none"> • Number of different ICT platforms on the market does not affect my lessons planning. It would be great to use more of them. It would be great if we could have other devices to be able to use other platforms. Also, if we could better use Pads. • I would like placing all ICT platforms that we use in the school into one with all necessary features. Data would be easier to transfer, you wouldn't have to do all this cross referencing and going over. I would not have so many tabs open. I personally think it would make it quicker and easier.
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	<p>figure out. So more offers on the market it takes more time to process.</p> <ul style="list-style-type: none"> • It would be a dream to place all ICT platforms we use in the school into one with all necessary features, but I think what also might happen, which what happen with SchoolSoft or Google Classroom, that after a while it limits you, because you stuck in that platforms and you can't use other ideas coming from the market. 	<p>the communication systems is not really working. The students do not know where to look for information.</p> <ul style="list-style-type: none"> • Placing all ICT platforms into one would be good. It would affect my work in a positive way. 	<p>features would be idea. It would be a lot simpler.</p> <ul style="list-style-type: none"> • Many teachers do not use ICT platform Happeo, because it is “another click away”. I find it very frustrating to work with. I find it too confusing to make it effective in any way. It would be much better if that was streamlined. 		
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5. Analysis

In analysis chapter I approach to the most important gathered primary empirical data presented in the Table 2. In the analysis I relate to knowledge and experiences from research articles with gathered empiricism with conceptual model support (see Figure 3). The Analysis chapter follows factors and variables in the conceptual model.

5.1. Characteristics of ICT platforms in education

Schools as organisations becoming main users of modern ICT technology from teachers' perspective (Fernandez-Gutierrez 2020:2). All interviewed Upper School Teachers in IES Tyresö receive a Chromebook (Chromebook description) and a mobile phone – smartphone from the organisation during onboarding process. All teachers say that are not aware of the procedures for the organisation of ICT structure. For example, the teachers do not know who particularly decides about what hardware and which ICT platforms the school will use. Some teachers do not know who decides about the purchase of specific devices in school. Two of five interviewed teachers (T1, T3) confirm that teachers in IES Tyresö cannot change the type of computer or upgrade the device, unless it is a request from entire department. The purpose of the upgrade would have to be specifically pedagogical for the use in the lessons, most likely for the students. A good example is music subject, where the music teachers use iPads in music lessons.

Using ICT to improve students' educational outcome reduces the education cost in long run (Fernandez-Gutierrez 2020:2). According to Prastikawati (2022:297) incorporated e-learning into classrooms matched to the digital era and meets students' expectations and needs. To be able to do that, the school would have to implement one-on-one computing. According to all interviewed upper school teachers IES Tyresö does not offer one-on-one computing for the students, which means that the students do not receive computers to use every day from the organisation. Only students with special needs have the possibility to receive a Chromebook for individual use. In case where a teacher needs the students to access ICT platforms, then the teachers need to book a trolley with computers in forehand in ICT platform SchoolSoft. In the day, when the lesson with students' access to ICT platform occurs, the teachers provide the computers in classroom and takes them back after the lesson is finished. Usually booking of computers is planned by the teachers for certain projects.

According to Wikan (2011b) many teachers feel that reaching digital competence by training in use of the new applications, programmes and platforms is required in their work. All interviewed upper school teachers in IES Tyresö feel that they receive only basic information about the functionality of the ICT platforms the organisation base their structure. According to the teachers, it creates more workload for them, because they need to learn how to use ICT platforms basing on trial and error method. The teachers feel that need time before they can implement ICT platform to practice.

According to the research made on users, the tools offered by GWEF is teacher-friendly due to flexibility in terms of working on different file formats (Lutfiana 2022:143). All interviewed teachers use GWEF for both administration and teaching. All teachers are satisfied with this ICT platform, especially in terms of the functionality. The applications that they use the most are: Gmail, Google Drive with additional Google Docs, Google Sheets and Google Sides.

According to Seifu (2020:3) curriculum guides and places requirements on the teachers what they teach and if they use ICT platforms or not. If usage of ICT platforms is not mentioned in the curriculum, then it is up to organization or up to the teacher, if any ICT platform will be used in the lesson. According to the teachers it is the organization that creates ICT structure in school and obligatory chooses the ICT platforms to use by them like SchoolSoft, GWEF, Behaviour Watch and Happeo. The teachers say that the curriculum does not select what platforms should be used and which devices. However, in some subjects there is obligatory introduction into ICT in the context of particular subject. Two of five

interviewed teachers (T3 & T4) said that they need to use ICT platforms in their lessons according to the curriculum. Those teachers teach English and Maths as the subjects. Usage of ICT platforms is part of the core content in curriculum according to both teachers. Teachers 4 also claims that not using ICT in lessons is making students a disservice.

From (2020:74-75) writes that together with technological and pedagogical development, The Swedish National Agency for Education first evaluates and then creates a new set of improvements in the national curriculum. It is not the curriculum that uses SchoolSoft as ICT platform, but it is the ICT platform SchoolSoft that interprets and processes the curriculum to use in the ICT platform in the interface for the teachers. Curriculum affects entire organization, because strategies on all levels of organization must always be compatible with the curriculum (From, 2020:74-75). All interviewed teachers say that after implementing new curriculum in 2022, they feel frustrated with how the curriculum is interpreted by SchoolSoft and due to this they have to use other ICT platforms to process students results and then place them into SchoolSoft to fulfil administrative requirement. All interviewed teachers admitted that they use simultaneously many ICT platforms to be able to enter data to SchoolSoft, e.g., Teacher 3 by translating the content of curriculum in SchoolSoft from Swedish to English, or Teacher 1 by composing list of students' grades in Google Sheets, where the interface is more comfortable and teachers' work is saved in real time, or Teacher 2 & 5 to compose comments in Google Docs, where there is spellcheck and other features that SchoolSoft does not have. The most common practice that the teachers describe is to prepare material in one ICT platform that allows them to do it in an expected way with necessary features and then copy and paste to the right place in other ICT platform: SchoolSoft.

Witte (2014:174) writes it is confirmed that ICT-infrastructure helps teachers in their daily routines, e.g., by automating processes and reducing time spent on administrative tasks (Witte 2014:174), however all interviewed upper school teachers in IES Tyresö confirmed that harmonising of simultaneous use of many ICT platforms is one of the challenges they meet at work. One of the reasons for their choice to place the same information several times to different ICT platforms is that the platforms they are forced to use according to the ICT policy to fulfil the requirements are missing important features. Teacher 1 explained: "I use GWEF to write feedback and later I paste it to SchoolSoft due to lack of needed feature in SchoolSoft". The same scenario of usage of SchoolSoft is repeated by Teachers 2, 3, 4 & 5 after asking different type of questions. All interviewed teachers have a negative opinion about SchoolSoft interface. According to Teacher 2 SchoolSoft is ineffective in many ways. All interviewed upper school teachers claim that they spend too much time on administrative tasks while using ICT platforms. They must spend even more time on administrative tasks when they have to place the same information several times to different ICT platforms due to the ICT policy and routines created by the organization. Due to this there is no trust to use more ICT platforms in school on top of the teachers already use at work. The teachers claim that they do not want to use more ICT platforms used for administration. All of them admit that any more ICT platforms to use at work would have to benefit particularly their teaching or their students in class. Teacher 3 also says that she would like to use less ICT platforms in teaching, but with more variety. A good example of the platform this teacher wants to use with more variety is GWEF, however the teacher says that it would be much more convenient for her to receive training in using GWEF, to be able to use it more accurately in teaching. Teacher 1 would choose to use more ICT platforms to expand the possibilities, especially pedagogical tools. Administrative ICT platforms only add workload that is already high and does not benefit the students or the teacher. Teacher 2 agrees with her colleagues that she would choose to use more ICT platforms if that could expand her possibilities and it could benefit her as a teacher and her students. Research shows that teachers are usually not to use ICT for teaching in class. Technology in this matter is too complicated and implementation of new processes based on something that they do not feel comfortable

with, feel they do not have enough competence about and might be problematic in general is not a good idea (Wikan 2011a:209).

According to Ghavifekr (2010:38) circumstances in the teachers' environment have to be user-friendly for implementation of new ICT platforms and Hammond (2011:192) also states that it requires strong confidence to be successful in performing specific tasks. The strong confidence cannot be reached without knowledge to perform specific tasks. Interviewed Teacher 5 mentions that differentiation of interfaces in the ICT platforms causes frustration. Lack of training in the platforms affects the confidence and perception of the platforms. During a specific task the teachers have many questions how to do certain things and how to find specific option in the platform. According to Teachers 5: "It is very confusing; it is a bit of a jungle. It is because they look so different, so you go in assuming that you will find something there, because you found it in another application, but then it is not there". According to the same teacher, there is also an additional problem when the same ICT platforms has a different interface on two different devices, e.g., a Chromebook and a mobile phone. According to the teachers (T1, T2, T3, T4) interface while using only one ICT platform is not a challenge. Together with the number of platforms raises the need for digital competence not only to be able to use one, but also more of them and combine the usage of all of them together. According to Teachers 1: "The more platforms you use, the more twerks and tricks there are that you don't know about. So if that was just one platform, it would be a bigger chance for you to know". Strong confidence reached by ICT platform training (Hammond 2011:192) is also necessary in the situations, where teachers see many options on the computers screen that they are not familiar with. On questions about the features in ICT platforms that are active, but not used the Teacher 4, who sees himself on very low digital competence level admitted that those are the places where he gets lost, and they make him uncertain in the usage of ICT platforms. The rest of the teachers (T1, T2, T3, T5) said during the interviews that active links and features that they never use do not disturb them. However, Teacher 3 mentioned those features make wonder why those features are there and cause uncertainty if that is something that they should do, of maybe the teacher missed something. Teachers 5 stated that as long she knows what she is doing and has the competence to use the ICT platform, then those features are not a problem at all.

According to Teacher 1 harmonisation of simultaneous use of many ICT platforms is difficult due to the hardware that the school provides to the teachers. Screens of the Chromebooks provided to the teachers in school are only 14 inches or less, which makes difficult to operate between tabs with many ICT platforms open in in the computer, for example manoeuvring between SchoolSoft and Google Sheet. Teacher 1 mentioned that she has grades of the students written in one ICT platform (Google Sheet) and then she entries those grades manually one by one to the SchoolSoft. To be able to do that, she proposes a solution, which could be an external monitor to use by the teachers that would significantly help with moving between many platforms. There is significant difference between digital transformation and digitalization (see subchapter 3.2). In Figure 2 there is marked that buying new monitors to the teachers would not be a digital transformation, which could be seen as expensive and scary for School Organiser and Management. Automation of this process would be a digitalization needed according to Teacher 1.

5.2. Level of digital transformation of school by ICT policy

Digital transformation has a wider term in use toward series of coordinated implementations in organization. It is a common mistake to confuse digitization digitalization and digital transformation. Figure 2 shows a significant difference between them and shows on a scale progress of the process from digitization to digital transformation. ICT policy is the important tool for the School Organiser and Management to implement digital transformation (Murithi 2013:197). Four of five interviewed teachers (T1, T2, T4, T5) said that they were introduced to ICT policy in IES Tyresö at new staff introduction in form of onboarding training sessions. They also are informed about the policy by mouth to mouth by

their colleagues. Teachers 1 & 2 claim that information about ICT policy is also passed on to the teachers during all staff meetings every week and also by emails. Teacher 2 said that he received appropriate training to use ICT platforms used in the company. However, Teacher 3 mentions that she was employed in the middle of the year and she did not get any chance to receive introduction to ICT policy in school. Teacher 3 had to work out the use of ICT platforms by trial and error method and by help from other teachers in department. Teacher 5 claims that onboarding process in terms of receiving information about ICT policy was random and not organized. According to him there was only the most important information passed on to the teachers with omitting deeper sense or training in ICT platforms. According to Teacher 2 ICT policy and routines are updated every term.

According to Wang (2022:511) School Organiser and Management is responsible to make ICT policy more transparent to the teachers, which allows the teachers to organize the teaching and learning process more efficiently. However, Teacher 1 does not know how often they are updated. The above information received from all interviewed teachers give the picture of the organisation that uses time before start of year to introduce the new teachers only into the most important parts of ICT policy in the organisation. The rest is left out as their own responsibility to get know those things from colleagues, from weekly meetings and email sent by the school leadership. The teachers joining the school in a middle of the year have no possibilities to receive fair amount of information about ICT policy of the organisation. According to Teacher 3 usage of ICT platforms in IES Tyresö is a simple thing to teach, if there was a course organised for the school staff how to use those platforms. This means that the important skill to provide the teachers is omitted by the organisation. According to Teacher 2 IES Tyresö provides the teachers with updates and needed software on Chromebooks by automatic installations forced by the organisation.

According to Kozlova (2021:2314) students benefit from ICT platforms by its availability and accessibility. Most students with use of ICT do not lose motivation in compare for traditional learning. Additionally, the students have a little better understanding of the study material and also effectiveness of leaning raises while using ICT platforms compared to traditional methods according to students' perception. There are so many advantages to use ICT together with ICT platforms in school, that today it is a standard in school around the world. Four of five interviewed teachers (T1, T2, T3 & T5) claim that according to ICT policy, the students in IES Tyresö get access to the ICT platforms by accessing Chromebooks in school. IES Tyresö does not have one-on-one computing, so the teachers need to book trolleys with computers for entire class and provided them only for the planned lesson. After finished lesson, the students need to give back the computers. According to Teacher 1 the teachers can provide the students information digitally only by SchoolSoft. GWEF, Google Classroom in particular, cannot be expected by the teachers to use by students, because the student do not have computers at home provided by the school. The school cannot expect the students to buy the computers on their own and according to Teacher 3, the teachers assume the students have access to the ICT platforms at home by their own devices: computers or mobile phones. In effect, according to Teacher 4 the organisation is double-dosing the students with information in different ICT platforms. Due to this, at least once a week the teacher needs to place the same information many times to different ICT platforms, which takes additional time and raises the workload for the teachers.

According to Seifu (2020:3) characteristics of technology determine the use of ICT platforms by the teachers. Innovations implemented by the schools' support integration of ICT in schools by the following attributes: relative advantage, compatibility, complexity, trial ability, and observability as perceived by individuals. The more teachers have to do manually within ICT, the less modern and innovated the entire ICT structure is perceived from their perspective. According to Teacher 1, the teachers need to place the same information many times to different ICT platforms especially by providing weekly planning to the students and guardians by SchoolSoft. The same problem appears when the teachers give feedback on students' work or their development. Teacher 2 claimed that he

needs to place the same information many times to different ICT platforms every single day or even couple times a day. The teacher complained it affect his lessons and it is extremely energy-consuming. An example given by the teachers in when students get late to the class he need to provide the same information to different ICT platforms. Teachers 3 explained that she needs to place the same information many times to different ICT platforms every time she enters weekly planning. This is very frustrating for her and she feels that the students are confused with the current information flow. Teacher 5 said the placing the same information to different ICT platform due to ICT policy in the company happens “reasonably often”. The reason is to provide everyone: staff, students and guardian with information and make sure everybody is considered in the communication flow. This means that all interviewed teachers confirm they experience higher workload and spend additional time due to placing the same information to many ICT platforms.

All interviewed teachers confirmed that they use the same ICT platforms for the same purposes in IES Tyresö: GWEF (described in subsubchapter 3.4.1.) for documentation, communication and composing tools for lesson presentation, and drive space; SchoolSoft (described in subsubchapter 3.4.2.) for demanded by the organisation and ICT policy administrative part and communication with the students and Guardians; Behaviour Watch (described in subsubchapter 3.4.3.) as register for students behaviour; Happeo (described in subsubchapter 3.4.4.) is used by the teachers to get access to school document templates and administrative information. Additionally, all teachers use Hogia once a month to check their payslips and also ICT platforms chosen by themselves for the purpose of providing education in their subjects Teacher 1 uses Goosechase, Kahoot, Citera, National Encyklopedin, Eduscobot. She also chooses to use Skola24 for the purpose of checking school schedules with better interface than it is offered by SchoolSoft. Teacher 5 is a music teacher and therefore uses ICT platforms specified for the purpose of providing materials for music lessons: YouTube and Spotify.

5.3. ICT Support

According to Seifu (2020:3) repairing contributes for the integration of ICT in teaching-learning process. Teachers need technical support in school to integrate ICT in their teaching (Wang 2022:512). All interviewed teachers said that the technical support in school is good and works very well. In case of a problem, they can email or call IT representative to receive needed help, that arrives quick. Sometimes IT representative is busy with other issues, which may extend the awaiting time. According to Teacher 3 every problem is solved by IT representative in under an hour. According to all interviewed teachers, in case of an ICT problem in organisation, they are informed as soon the problem is discovered. Teachers 2 claims that administrative support is also good. The teachers receive help with ICT platforms from heads of their departments. Teacher 2 said that every ICT platform in school has a responsible person that they can turn to in case of a problem.

Teacher 3 said that the current functionality of ICT platforms in school is simple, but all the routines around that are confusing. This means that as long functioning of one platform is easy for the teachers to get familiar with, the simultaneous use of many of them is becoming a challenge in terms of following the rules and routines created in ICT policy. The process of onboarding of new teachers is unclear according to Teacher 3 & 5. Teachers 5 explained that for her it was random and not very organised. Administrative support positively affects the process of integration of ICT in teaching. Onboarding process in theory belongs to school administrator responsibilities, but according to Teacher 3 onboarding process in IES Tyresö is unclear. Administrators supposedly should share their tasks with subordinates while focusing on the integration – all influenced by a proper technology leadership. Degree of administrative support stimulates the integration of ICT in teaching and use of ICT platforms by teachers (Seifu 2020:3).

5.4. Degree of harmonisation of simultaneous use of many ICT platforms

Teachers to feel confident about using ICT must consider technological and pedagogical components because both are essential for use of ICT (Suárez-Rodríguez 2018:1167). One of the major factors affecting the use of any ICT by teachers is their digital competence. Research has shown that it is a key to effective use of ICT by a teacher, which is connected to possibility of using any technology or application in relation to teachers' role (Seifu 2020:3). That is one of the reasons, why ICT is important part of initial teacher training (Suárez-Rodríguez 2018:1183). All interviewed teachers said that they have enough digital competence that they need to do their job, but they are not interested in technologies. Teacher 4 said that his digital competence is very low and he is not very good with computers. Some of interviewed teachers admitted that they had none (T1, T2) or very little (T4, T5) ICT training at their university. One teacher said that she had very much computer skills at school and also ICT training at university. The focus was on Microsoft Office ICT platform and source criticism. Teachers 1 & 2 said that they learned how to use ICT platform by received general instructions and later in practice. Teacher 2 specified that training for ICT platform was provided by an IES Tyresö employee: IT representative, first teacher, head of department or coordinator. The training was characterised going through the basics of platforms: SchoolSoft and Behaviour Watch. According to Teacher 2 there was also offered training for the technologies, but he decided not to do it.

According to Wikan (2011b) many teachers feel that courses and training in any area, not only ICT, is useful for them, if outcome from the course benefits their students, when it is later implemented as part of their teaching. This is confirmed in the interviews with all teachers. All interviewed teachers would like to expand ICT competences at work. They all would like to focus especially on the educational possibilities of ICT platforms and how they can be used for students' benefit. However Teacher 2 specified that he would like to use less ICT platforms in teaching. Teacher 3 marked that the students in Sweden do not have enough digital competence to be able to cope with ICT platforms that the teachers could introduce to them in lessons. She said: "Kids in Sweden have less knowledge of how to work with computers. We think they are digital natives, because they grow up with social media, but they don't know how to put a word document into columns, and they don't know how to write with appropriate font", which means that assuming that the students know the basics very well, because they are familiar with using social media is a wrong assumption. Teacher 1 mentioned hardware problem in IES Tyresö. According to her, she is not able to provide lesson with use of ICT platforms by the students, due to lack of reliability of the computers in the school.

Teacher 2 said that using ICT platforms is not stressful for him. However, Teacher 5 claimed that "almost everything is still challenging to cover in terms of using ICT platform". The main issue for Teacher 5 is to find the information on demand. According to the teacher 4 & 5: "I know exactly what I need, but then I don't know how to get it". The problem occurs because the platforms are complicated and because of number of them. Answer from Teacher 3 is very similar: "in using ICT platforms still challenging for me is to keep track of where I have to put what data". Teacher 4 claimed problems with specific ICT platforms: GWEF: Google Slides and Happeo in context of lack of digital competence. He feels that things that should be done quick take much longer time. He feels confident with use of ICT platforms, but if something unexpected happens, he feels lost. Usability describes how easy it is to learn and use the ICT platform if the ICT platform is easy to receive help with by looking into documentation or guide (Eriksson 2008:45). Comparing the description of the interviewed teachers about the issue and the definition of usability, it may be that general degree usability of the ICT platforms decreases together with the number of them that the user is forced to use simultaneously.

All teachers said that the number of ICT platforms make their work environment stressful and complicated. According to them there is too much admin requirements from the organisation, which naturally affects the number of ICT platforms used in the organisation. Teacher 1 said that instead of giving the students feedback and focusing on their development, she spends too much time on

administration. The teachers complained about time waste on feedback for the students placed in many ICT platforms instead of using more practical and direct solution, for example providing the student and guardian feedback on the handed in assessment. According to her, every ICT platform she works that is separated from SchoolSoft is double-work and in case of giving the students feedback, it is the GWEF: Google Classroom. Teachers 1 said: As long you are in the bubble of one platform provider, everything works good". Administration takes away time from teaching and lesson preparation, according to her. The biggest stress factor in teachers' work according to Teacher 1 is not assessing the test, but having the pressure of putting it in the ICT platform. Teachers 3 explained that after implementing new curriculum her workload increased due to changing the interface in knowledge requirements section in SchoolSoft and how grading is now expected to do: "Subject rubrics or grading criteria now have been squished together, when before there were broken up to different sections, which means that I cannot rely on SchoolSoft to do my grading, because it is not settle enough. I use spreadsheet in a separate ICT platform to cope with this". Because of this, Teacher 3 chooses to support herself with an additional ICT platform. On top of that she said, that she has to use hard copies of the documents for even better comfort of using the ICT platforms all together. Teacher 2 said that due to the number of ICT platforms he forgets about the responsibilities he has to fulfil. He said: "The number of routines combined with the number of ICT platforms used in school make my life much more complicated. Giving feedback to students and sharing it with students and parents creates complication with choice of the right ICT platform to do it. Also, depending on which department the teacher belongs, the routines are different. There is no one system for all teachers in school". This quote matches the opinion from other interviewed teachers. According to Teachers 3 it is doubling the workload to use many ICT platforms. For her, as well as for Teacher 2, it is easy to miss something with many tabs in the computer open. Teacher 5 said that using many ICT platforms make her really annoyed and it does disturb her and also takes the concentration away. Important addition to what her interviewed colleagues said is that the workload multiplies, when she start double-checking if she did was she was supposed to do. Eriksson (2008:43) describes functionality as what system can do, so degree of functionality from teachers' perspective is what teachers expect from the ICT platform to do and what actually the ICT platforms does. In this matter functionality of simultaneous use of many ICT platforms raises due to their features that add up together with they number. However, it is important that still together with the number of ICT platform the usability decreases.

According to Basak (2015:435) teachers' positive attitude towards these can easily provide useful insight about the integration of ICT into teaching and learning processes. All interviewed teachers were asked about a scenario when all features from all ICT platforms would be placed into one ICT platform and implemented to the company. Four of five interviewed teachers (T1, T2, T3, T5) responded positively. They all agreed that usage of ICT would be much simpler, easier, and quicker in theory. According to Teachers 2 the current number of ICT platforms is frustrating, and it affects him negatively. According to him the number of different ICT platforms negatively affects the communication system, due to the students who do not know where to look for information. Teachers 5 explained clearly: "data would be easier to transfer, you wouldn't have to do all this cross referencing and going over. I would not have so many tabs open. I personally think it would make it quicker and easier". Teachers 3 gave an example of why staff in IES Tyresö tend to do not use Happeo only because it is just another ICT platform to use and it, as the teacher said, "another click away". However, Teacher 4 explained that placing all ICT platforms into one with all necessary features would be a huge mess. According to him "it might be quicker to access certain things, but it would be a learning curve. It would take some time to figure it all out, because it could end up being a huge mess". Teachers 1 also said that what could happen is that after a while one ICT platform would limit the teachers. There are so many new options on the market that having all features in only one platform would close the door for development of ICT according to the national and international ICT development pace.

According to Basak (2015:435) teachers' attitude and an inherent resistance to change together with attitude towards technology and resistance to organizational change and resistance to outside intervention are factors affecting teachers' successful adoption and Implementation of ICT in teaching and learning. All interviewed teachers made their own way to harmonise the simultaneous use of ICT platforms. According to their answers, they found their own way of operating the ICT platforms on their own devices and operating tabs. Teacher 2 found a way of making the number of tabs in the device a "to do" list, which is a functional and smart method of not forgetting the responsibilities in teacher's role.

According to Witte (2014:174) ICT platforms are used in modern schools for example to collect students' tests scores, monitor progress of students' achievements to their parents, share information among the teaching staff, etc. In theory, ICT platforms could be an easy way for the teachers to decrease the workload and let the computers do most of the hard work for them. Looking for the new possibilities could be a chance for the teachers, however it might take additional time and paradoxically add workload. All interviewed teachers said that the number of ICT platforms on the market does not affect planning of their lessons. However, all teachers said that any new ICT platform for them to use would have to take time to implement in their teaching. Teacher 4 said that he gets information about new possibilities and ICT platforms during professional development days or conferences with teachers from other schools, but he would always need time to get familiar with the ICT platform, before he was ready to implement it in teaching. Also, Teacher 1 said that she is more frustrated about using current ICT platform in school than searching for the new ones.

6. Conclusions

The purpose of this bachelor thesis in Information systems is to identify, describe and explain degree of harmonisation of simultaneous use of many ICT platforms among upper school teachers at one Swedish school.

Based on the conceptual model (see Figure 3) there was a primary empirical data gathered. After careful analysis of primary empirical data, it appeared that some factors are considered more important than others regarding the impact on dependent variable: *degree of harmonisation of simultaneous use of many ICT platforms*. Based on the analysis four most important conclusions are presented below.

6.1. Amount of administrative work and school's choice of ICT platforms for this purpose

According to the empirical study the amount of administrative work for upper school teachers and the school's choice of ICT platforms for this purpose with given guidelines and routines are an important factor for harmonisation of simultaneous use of many ICT platforms. The teachers said that unnecessary bureaucracy that have very little to do with students' development is a big part of their role and their workload grow by simultaneous use of many ICT platforms use for this purpose. Many of the administrative tasks are seen as less important than teaching in classroom. Challenge to harmonize the simultaneous use of many ICT platforms by teachers is caused by routines imposed by School Organiser and Management. Very often the teachers need to provide the same information many times to different ICT platforms for the purpose of fulfilling administrative responsibilities. ICT platforms in the school do not synchronise with all data in organisation, which means that very often data have to be entered manually by the teachers. This is seen by them as wasting time, energy, and cause of suffering from stress.

Interface of some of ICT platforms during fulfilling administrative responsibilities is also not satisfying for the teachers, which inclines them to simultaneous use of many ICT platforms and in effect to harmonise cross-referencing between them.

In this study conceptual model was build based on study literature. Considering the primary empirical data, the indicator *degree of teachers' involvement in creating ICT policy* by actor School Management

and Organiser is the key for dependent variable Level of digital transformation of school by ICT policy is important to understand teacher's daily tasks in practice and how the teachers are able to cope with the workload. Degree of harmonisation of simultaneous use of ICT platforms can be explained by the users of those platforms. Due to the number of administrative tasks that teachers need to do every day another indicator *degree of administrative support* in variable *ICT support* by actor Administration has a significant influence on the teachers' degree of harmonisation of simultaneous use of many ICT platforms.

6.2. Training in use of all imposed ICT platforms

According to the empirical study training in use of ICT platforms imposed by the organising is an important factor affecting harmonisation of simultaneous use of many ICT platforms. The teachers did not receive extensive training in use of any ICT platform in school during onboarding process. Due to this their digital competence received in university courses, professional experience or private interest are the only base, which allows them to understand brief instructions given by the organisation and approach to harmonization the simultaneous use of many ICT platforms imposed by the organization.

The teachers are open for development. They would like to expand their digital competence if that would benefit them individually or their students. Also, most of the teachers would like to use more ICT platforms, but only for the educational purpose.

In this study conceptual model was build based on study literature. Considering the primary empirical data, the indicator *degree of leadership involvement towards implementation of ICT policy* in variable *Level of digital transformation of school by ICT policy* by actor School Organiser and Managers steers teachers' preparation for further use of the ICT platforms in school by organising needed courses and training.

6.3. Hardware in school available for teachers and students

According to the empirical study hardware in school available for teachers and students is an important factor affecting harmonisation of simultaneous use of many ICT platforms. One of the interviewed teachers explained an issue that other interlocutors are describing with different words and use other tools to deal with it. The teachers in IES Tyresö receive Chromebooks with 14 inches (or less) screens which affect the capability for human perception to simultaneously operate interfaces of many ICT platforms, especially during cross-referencing between them. One of the teachers said that she prints out hard copies of documents to be able to perform better in simultaneous use if many ICT platforms.

In this study conceptual model was build based on study literature. Considering the primary empirical data, the indicator *degree of accessibility to ICT* in variable *Level of digital transformation of school by ICT policy* by actor School Organiser and Managers represents the degree of accessibility to appropriate digital resources by the users of ICT platforms in IES Tyresö.

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Oral sources

Björn-Andreas Eriksen principal for Internationella Engelska Skolan Tyresö
Probing dialogue, personal communication, 2022-09-20

Teacher 1, Upper School Teacher for Internationella Engelska Skolan Tyresö
Interview, personal communication, 2022-12-22

Teacher 2, Upper School Teacher for Internationella Engelska Skolan Tyresö
Interview, personal communication, 2022-12-21

Teacher 3, Upper School Teacher for Internationella Engelska Skolan Tyresö
Interview, personal communication, 2022-12-22

Teacher 4, Upper School Teacher for Internationella Engelska Skolan Tyresö
Interview, personal communication, 2022-12-22

Teacher 5, Upper School Teacher for Internationella Engelska Skolan Tyresö
Interview, personal communication, 2022-12-22

Appendixes

Appendix 1. Probing dialogue

Probing dialogue with Björn-Andreas Eriksen, principal of Internationella Engelska Skolan Tyresö

Date: 20/09/2022

Present: Björn-Andreas Eriksen (principal of Internationella Engelska Skolan Tyresö)

Student: Piotr Piotrowicz

Björn-Andreas Eriksen is a principal of Internationella Engelska Skolan Tyresö for 1,5 years. The school is a free school with Internationella Engelska Skolan AB as the school organiser. In IES Tyresö there are 960 students and 99 members of staff, 68 of whom are teachers. 49 all members of staff are Swedish and 50 of them are different nationalities from around the world. The multicultural environment applies to both: administration, and teachers.

Björn-Andreas Eriksen described the IT environment in IES Tyresö, along with mentioned other IES facilities in Sweden, that they use many ICT platforms in their IT structure. According to Björn-Andreas SchoolSoft is the main school administration tool and a way for communication with students' guardians, Google Workspace or Education Fundamentals for communication, main office utilities, and teaching, Happeo for intranet, Behaviour Watch for reporting information about students, and more platforms after their individual wish or for special purpose in specific roles, e.g., Hogia for school economist. School prepared itself for GDPR (General Data Protection Regulation) appliance in 2018, which effected with all staff being trained and prepared for usage of ICT according to the data privacy regulations. Data protection is coordinated by Data Protection Contact Person. Björn-Andreas mentions one IT representative working full-time in school, who is responsible for IT onboarding, implementation of all hardware and software, and technical support. IT representative receives templates, routine instructions and recommendations from Head Office Central IT Team and discusses IT issues and problems with IT representatives from other schools that belong to Internationella Engelska Skolan AB.

Björn-Andreas Eriksen says that understanding of the purpose ICT is very important for the teachers to be able to use it. Digital competence of the teachers is very differentiated, from very low up to high knowledge, depending on the age, experience, education, and interests. The teachers he met in his career very often did not understand what digitalisation and digital transformation are and how both affect them individually. Their focus was on the ability to handle a computer and use "cool" software that is engaging and fun for the students, without any pedagogical aim. There is a general problem to use given software in wide definition of it in the right way with the clear purpose. The goal for school leadership is to make sure that those with the lowest digital competence on acceptable level to deliver quality lessons to the students, also using ICT, and be able to be successful in administrative part of their roles.

According to IES Tyresö principal, the key is to allocate digital resources and training effectively, to fulfil all requirements of The Swedish National Agency for Education, keep high standards of the lessons and school administration in manner of ICT with small resources given by the municipality. Politicians very often do not consider growing needs to fulfil mentioned The Swedish National Agency for Education demands.

New teachers have problem to start directly to teach in their first day due to the number of different ICT platforms in the school. All platforms have similarities with functionality, with the purpose. All platforms used in IES Tyresö are complexed and have differences in interfaces, which makes it very complicated for the new staff to smoothly start effective teaching, due to lack of time and resources for comprehensive onboarding process. There is also no time during school year, as well with resources, for effective ICT training for the teachers to higher their digital competence and knowledge to use ICT platforms they work at. Björn-Andreas says that it would have to be implemented for the cost of replacing training sessions needed more in their roles, for example new curriculum (LGR22) introduction. Degree of harmonisation of simultaneous use of ICT platforms in IES Tyresö could be a big issue because of lack of training, low competence and it is worth further investigation.

Appendix 2. Guide for semi-structured interview with upper school teachers in IES Tyresö

Introduction

Do you permit to audio record the interview for the purpose of analysis of your words?

1. Background of the respondent

- 1.1. What is your role in school?
- 1.2. What classes do you teach?
- 1.3. Which subject do you teach?
- 1.4. Are you a mentor?
- 1.5. Do you have any additional role in school?
- 1.6. How long you work in IES Tyresö?
- 1.7. How long you work as a teacher?
- 1.8. Are you a qualified teacher?

Upper school teachers in Internationella Engelska Skolan Tyresö

2. Characteristics of ICT platforms in education

- 2.1. What kind of hardware are teachers provided with in the school?
- 2.2. What are the opportunities for teachers to upgrade hardware and/or software in case of a need?
- 2.3. Who chooses the devices for the school and how teachers participate in the choice?
- 2.4. What devices are the students provided with? Is there one on one computing implemented in the school?
- 2.5. What ICT platforms are the teachers and students provided with?
- 2.6. How differentiation of interface in the ICT platforms is disturbing you in the efficiency of your tasks?
- 2.7. How features of the ICT platforms that you do not use, but they are still active are disturbing you in your tasks?
- 2.8. Would you choose to use more apps if that could expand your possibilities and it could benefit your as the teachers and the students? Why?
- 2.9. What ICT platforms you use during your lessons for teaching, including those that you allow to be used by the students?
- 2.10. How is curriculum placed into different ICT platforms? Is the teachers responsible to use the planforms in the way that curriculum stands or there is support that makes the usage of the apps more efficient for the teachers?
- 2.11. In what way the curriculum forces you to use ICT tools in your lessons? What ICT platforms are unavoidable in this process?

3. Level of digital transformation of school by ICT policy

- 3.1. How were you informed about ICT policy in school?
- 3.2. How your onboarding process looked like in terms of receiving information on IT routines?
- 3.3. How often ICT policy and routines are updated?
- 3.4. How often you receive information about new policy updates?
- 3.5. How information about ICT policy updates is passed on to you?
- 3.6. How you as a teacher can get access to ICT platforms used in organization?
- 3.7. How the students get access to computing during the lessons and outside the lessons?
- 3.8. What ICT platforms you use at work for what purpose?

- 3.9. Is it choice of yours? If no, would you prefer to use different platform with similar profile?
- 3.10. How often you need to place the same information many times to different ICT platforms according to the routines or your needs?
- 3.11. Did you receive appropriate training for the usage of the app? If yes, who introduced you into this and in what form did you receive the training?
- 3.12. What makes it difficult to use so many different applications for all different purposes?
- 3.13. What do you think about the idea that all the platforms could be changed into one with keeping all the functionality?

4. ICT support

- 4.1. Who is responsible in school for technical support in ICT?
- 4.2. How you notify about a problem with ICT platforms?
- 4.3. How quick the support is responsive in case of your need with ICT platforms?
- 4.4. How your IT onboarding process looked like? Who provided the process of onboarding?
- 4.5. What kind of administrative support you receive in school in terms of ICT platforms?
- 4.6. What is the process of notifying an issue with routine problems around ICT platforms?

5. Degree of harmonisation of simultaneous use of many ICT platforms

- 5.1. How would you describe your personal interest in computer technology and level of your digital competence?
- 5.2. What kind of ICT training you received during your university studies? Who provided the training?
- 5.3. What kind of ICT training you received in your professional carrier? Who provided the training?
- 5.4. What kind of ICT training you received in terms of ICT platforms that you currently use in your school? Who provided the training? Please explain specifically for every each one.
- 5.5. Could you describe your ability to fulfill all requirements given by the organization with usage of ICT tools?
- 5.6. What areas are still challenging for you to cover in terms of using ICT platforms?
- 5.7. Which tasks are challenging for you and are not fulfill due to problems with ICT platforms or ICT in school in general?
- 5.8. How the number of routines with the number of ICT platforms correspond with your current workload in school?
- 5.9. Please describe how you work with many ICT platforms on one device. What is your personal strategy and how did you manage to set up this strategy? Did you come to this yourself, is it an effect of IT training or something else?
- 5.10. How you cope with different features of all ICT platforms and what kind of support you require in terms of this?
- 5.11. How using many ICT platforms affects your process of focus? Does it disturb you to concentrate on the task with a feeling that you are multitasking even if you are in one process?
- 5.12. How you like to expand your competence after work within ICT?
- 5.13. How you benefit from using ICT platforms in your lessons?
- 5.14. How you benefit from using ICT platforms in administrative part of your job?
- 5.15. How would you like to expand usage of ICT platforms in your lessons?
- 5.16. How the number of different ICT platforms on the market affects your lesson planning?
- 5.17. How would you see placing all ICT platforms that you use in the school into one with all necessary features? How would that affect your work?

5.18. Which ICT platforms would be better for you to use in your teacher (in class), mentor also administrative roles compared to those that your school provides?

Appendix 3. Interview with Teacher 1

Date: 22/12/2022

Introduction

Do you permit to audio record the interview for the purpose of analysis of your words?

- *Yes.*

1. Background of the respondent

1.1. What is your role in school?

- *I am a Social Science teacher.*

1.2. What classes do you teach?

- *This year I teach three grade 7 and two grade 9. And previously I taught Grades 8s and 9s.*

1.3. Which subject do you teach?

- *Social Science. It is actually four subjects. I give grade in four subjects.*

1.4. Are you a mentor?

- *Yes. So far I mentored Grade 8 and Grade 9.*

1.5. Do you have any additional role in school?

- *No.*

1.6. How long you work in IES Tyresö?

- *This is my fourth year teaching here and teaching for IES.*

1.7. How long you work as a teacher?

- *Six years.*

1.8. Are you a qualified teacher?

- *No. I am actually not. I have the full teaching degree, but I have some problems with the authorities.*

Upper school teachers in Internationella Engelska Skolan Tyresö

2. Characteristics of ICT platforms in education

2.1. What kind of hardware are teachers provided with in the school?

- *Oh, now we are talking devices. So I get a mobile phone and I get a chromebook.*

2.2. What are the opportunities for teachers to upgrade hardware and/or software in case of a need?

- *I feel I have a no for me personally, as a teacher. If we had a need as a department for a subject, I guess we could do it, but it had to come out from our social science budget, which makes it complicated, because that is tight. And we have physical books and not copies. And that is expensive, but it is good.*

2.3. What devices are the students provided with? Is there one on one computing implemented in the school?

- *The students are not provided with any devices and the school is very good at informing teachers about the Swedish curriculum, which is that you cannot demand that students have access to a computer, but you can expect them to check SchoolSoft on a mobile phone, even though it is personal. That is a huge different from the previous school where I worked, because here the foundation is none-digital.*

2.4. How differentiation of interface in the ICT platforms is disturbing you in the efficiency of your tasks?

- *Google is spread between so many different apps and then you create an Google Sheet, because somehow you need to write down another feedback to copy and paste to SchoolSoft, because you can't write something new in SchoolSoft, because if you write something new in SchoolSoft, you can't keep track of a class. That they look different... I think if you are not used to ICT platforms it creates more job, because you need to figure out how they work. But since if you have done it... I have done it for a while, I don't think it adds my workload. I don't have a challenge with it. Well Behavior Watch is a bit weird. So maybe I should not be so positive. But that is maybe I am not using it that much. When it is SchoolSoft you use it a lot, Google platforms you use it a lot, so it doesn't matter. It is not the interface that is the challenge. But of course, as I said with my example previously, the more platforms you use, the more twerks and tricks there are that you don't know about. So if that was just one platform, it would be a bigger chance for you to know.*
- 2.5. How features of the ICT platforms that you do not use, but they are still active are disturbing you in your tasks?
- *No.*
- 2.6. Would you choose to use more apps if that could expand your possibilities and it could benefit you as the teachers and the students? Why?
- *Yes, I would. Especially pedagogical tools, but the pedagogical small tools is not the issue. It is the admin platform that is the issue. That is the workload. Can I add something to devices? Because I would say I am missing a device, but it is not a device in itself you can interpret, but it is the screen. Because connected to the ICT platforms and having all the tabs and can you imagine you sit with this tiny chromebook and you have SchoolSoft and then you have your excel sheet and you need to keep track, so you enter the right grade and it is a tiny, tiny little... It is crazy. My Chromebook has a 14 inches screen, some teachers have even smaller screens. So I am missing and I have a colleague who are gamers and they do this at home on their gaming screens. They sit with two screens and I don't even have a screen. So talking about devices at least somewhere where you can go and check in your chromebook, so you can have a big screen – that would actually help with ICT platforms, when you are moving between them. And you know I have exceptionally small chromebook, but that is exception right now. But that reminds me that this is not a good work tool. And that maybe is the opportunity to have screens in school to plug in to would be a help with ICT platforms usage as well.*
- 2.7. How you as a teacher can get access to ICT platforms used in organization?
- *I can only expect them to check things like SchoolSoft and maybe information in Google Classroom? I can't really expect them to use Google Classroom. Google Classroom is an additional tool if we do provide devices. But SchoolSoft they can check in their mobile phone. So I really cannot expect them to have. It is more like I provide them with an opportunity to watch concept movies, to practice name geography on Citera, but I had to have a non-digital backup, so it is actual double-planning sometimes.*
- 2.8. What ICT platforms you use at work for what purpose?
- *So, ok... W got SchoolSoft, which is the demand for admin part, keeping track of attendance, and assessments, grading, communication with students and parents. And then of course we have Google Workspace for Education Fundamentals, but I think it is worth mentioning that is different part that you have ther whole meaning system, Google Classroom, if you want to use that, you have Google Docs and you have Google Drive. And the Google Drive is actually really helpful. That works for teacher to share documents, when you know how it works, I am very pleased with that. If worst come and you don't have your work with you, then you can actually log in to that from another device. I have never done it, since working here as a teacher I really try to keep my private computer separate from my work computer. So even if I had a gaming*

screen at home, probably I wouldn't be using them. Trelson is becoming more and more important, even though is not good always, because it is very separate entity, you can't give feedback, you can't see... Behavior Watch I have to use. Yeah. There are loads more. Google... Goosechase, Kahoot, Citera, National Encyklopedin, I would UberPlay and if we could get the SLI option in our school, that would be brilliant. That is my dream. Everything connected what we have InläsningsTjänst. Concept movies are great. I am opening my computer now to watch my tabs. I spoke about Drive... Google Classroom... I am actually using Skola24 a lot, because the schedule view is much easier than SchoolSoft to see schedules than SchoolSoft. We have books digitally for teaching subscription, so I use that a lot too. We mentioned Eduscobot. Every once in a while I have to go to Hogia. Those are the key ones.

2.9. How often you need to place the same information many times to different ICT platforms according to the routines or your needs?

- So it is a... Mostly SchoolSoft, whichever other tool I am using, if I am in Google Classroom and I write what are we doing I have to make sure it is always in weekly planning in SchoolSoft. We already spoken about the feedback issue. So everything else channels into me having to use... if I look at the schedule in Skola24, I do the attendance in SchoolSoft.

3. Level of digital transformation of school by ICT policy

3.1. How were you informed about ICT policy in school?

- At my first new staff introduction, digitally, and also nano lessons, even if that was focused on GDPR, it actually helps you when it comes to ICT platforms as well. You start things. The nanolessons are not so bad actually.

3.2. How your onboarding process looked like in terms of receiving information on IT routines?

- I think I rely very much on the staff meeting in the Aula. If there is something important happening, it should be said there. And when it comes to grading, curriculum and that part the academic coordinators are the key, because what happens there is yes, we share the same ICT platforms, but if the teachers don't use them the same, we send a different message to students and parents and that creates a lot of mess and confusion. And emails. Emails are actually good.

3.3. How often ICT policy and routines are updated?

- I have not idea. I don't know if there is a schedule for it. I just expect them, if there is an update, I get an email or someone says something in the Aula.

4. ICT support

4.1. Who is responsible in school for technical support in ICT?

- Mr Piotrowicz. IT representative.

4.2. How you notify about a problem with ICT platforms?

- I call if it urgent or I send an email. It works really well.

4.3. How quick the support is responsive in case of your need with ICT platforms?

Quick. Responses are quick. Sometimes he is not able to have the stuff to sort out.

5. Degree of harmonisation of simultaneous use of many ICT platforms

5.1. How would you describe your personal interest in computer technology and level of your digital competence?

- I would say I am a good quick learner and I worked in several workplaces and I am used to adapting to new digital tools, but I have no training.

5.2. What kind of ICT training you received during your university studies? Who provided the training?

- *During my university studies... No actual training. We did look at pedagogical digital tools, such as you know: filming, giving feedback digitally, maybe using digital test.*
- 5.3. What kind of ICT training you received in your professional carrier? Who provided the training?
- *As a teacher it is pretty much learning by doing except for some curriculum training, such as how to use SchoolSoft and then when I first I arrived in IES Tyresö just general instructions. And then we sort of continuously got little bits how to use Behavior Watch and opportunities to go and look at it, so it is their but it is bits and pieces.*
- 5.4. Could you describe your ability to fulfill all requirements given by the organization with usage of ICT tools?
- *I feel that some of the requirements are more focused on admin tasks rather than helping and giving feedback that has a pedagogical results for the students. My biggest issue is SchoolSoft. That is doesn't really fit and the feedback structure. The amount of work and that the new ideas, which is not the The Swedish National Agency for Education, not the curriculum, but the way the SchoolSoft is operating with the curriculum is crazy for me. It is double work. Because I am used to give feedback on written test and now I have to put this feedback in SchoolSoft, so everybody can see it and it been crazy this year. And maybe we put too much pressure on ourselves to do a good job, but it has been ridiculous. So SchoolSoft as a platform actually creates more work than it helps. As it is now we use Google Classroom sometimes when they have written assignments and they are allowed to do it in more places than in school, because to have a fully safe platform we have to use Trelson, because there are lots of AI, robots and lot of that going on. But in classroom it is possible to give feedback, comments that actually the parents can access. So that is helpful. When I give feedback it is accessible for students to see. It is not double or triple work when I use that function. It is still has to be in SchoolSoft somehow. And then... Back to the question again. For me, but that is maybe because I don't do that much Behavior Notice that is just working on the side, so that is ok. And when you don't have a lot of issue with a class, that is not that overwhelming in Gmail. But that I had issues with students before and that gets crazy to follow up Gmail, Behavior Watch and you can't change things in Behavior Watch and so on. So I would say my biggest clash that is creating double work is actually the teaching platforms which is Google, Google Drive, Google Classroom and then a separate platform SchoolSoft for giving feedback. That is double work. So it is the teaching role pressure on the platforms that create more work rather than the mentorship role for me. But I have been only the mentor for grade 8 and 9 so far.*
- 5.5. What areas are still challenging for you to cover in terms of using ICT platforms?
- *I would say... I am thinking is there anything else? I can see coming the challenge of wanting to use Google Classroom for assignments, but I am not able to trust with digital robots and so on and we will have to use Trelson more and Trelsson is more locked so you can't have that feedback. And Gmail works, Google Clanedar works, so I think Google Workspace for Education Fundamentals connect, but when you add platforms you get a challenge. And in previous works as long you are in the bubble of whatever provider you have it is sort of works.*
- 5.6. How the number of routines with the number of ICT platforms correspond with your current workload in school?
- *I call it the admin workload. The routines for me is the admin workload and it takes a lot of time away from the teaching and preparation and actually for me it takes more time to give feedback on the test having to use the systems, so if I sit with the written test in history it takes me at least double the time, because I have to use the demanded systems and sometimes for me personally that is such a threshold that I push it. If I could just take the test and write feedback and that is enough, it would be done. So it has become stress factor for me and it is not assessing the test,*

it having the pressure of putting it in the admin system. And I am not bad with the admin system, so it is not that I don't know the admin system. It is like ticking the boxes, formulating yourself, it is that you don't have the actual test there, so how can the kids are supposed to understand your feedback without seeing their test? How can the parents understand the feedback without seeing the test?

5.7. Please describe how you work with many ICT platforms on one device. What is your personal strategy and how did you manage to set up this strategy? Did you come to this yourself, is it an effect of IT training or something else?

- *I have sort of created a practical tab structure, where I always have... Because the Happeo opens as the first thing, so it is just left there in the corner and sometime I have the cover thing open. And then I keep Gmail, SchoolSoft and then comes the more like subject oriented depending on what I am doing. And it works except for when it has to reload. And then I have to open everything up again. But that is how I organize it. And some just to feel safe and secure, some of the major one of course I have marked favorite, so I know I get just get Behavior Watch. It is just trial and error.*

5.8. How you cope with different features of all ICT platforms and what kind of support you require in terms of this?

- *The thing is that I don't know about the possibilities that well. For example in SchoolSoft I just found out at the beginning of this semester that If you book a trolley, you can put several weeks in one booking. So there are a lot of shortcuts to take or how to make a copy of an assignment that you put in SchoolSoft several years ago, then you have to go back. So it is a lot of learning from your colleagues. You just happen to mention like you are sitting this and you be frustrated: yeah, but you know you can do that... Oh, ok I can do that. I would say that is how I learned the most and I wasn't new to Google Docs or Google Classroom when I came here.*

5.9. How using many ICT platforms affects your process of focus? Does it disturb you to concentrate on the task with a feeling that you are multitasking even if you are in one process?

- *I think the major challenge is the teaching platforms are separated from SchoolSoft. And then of course you have Behavior Watch, but then you keep an eye on mentor students attendance and so on in SchoolSoft, but that is not as time consuming as the teaching clash. So of course I wouldn't say I loose focus, but it adds stress.*

5.10. How you like to expand your competence after work within ICT?

- *SchoolSoft feels very rigid. And I am more interested in platforms that are flexible that can help me in teaching, such as Google Classroom and Trelson and how to communicate with the students, because then I can do things. SchoolSoft is more like this is what we did to you, so we get new curriculum and then SchoolSoft maybe in collaboration with IES decided they were going to keep like the block text together for different grading criteria, even though for example in history it has three value words and before it used to be split up and now it is all in one. And yes, I have holistic assessing of the students, but that created more work actually, because it is a huge different between having a good subject knowledge and seeing the consequences and courses in history. But I can't do anything about that.*

5.11. How would you like to expand usage of ICT platforms in our lessons?

- *I am sorry, but the usage of ICT platforms in my lessons means that we have functioning trolleys and computers to use. So When we have that and we can trust that... My subjects are really research oriented, so I could do more of that, but I limit that nowadays. I could give the students instead of writing their answer on piece of paper, I could let them answer in Google Classroom and I could follow up how are their doing with their answer. I can't do that. I used to do that in my previous school, but that was on one-on-one computing school, which has its negatives sides too. I am not taking any sides in this, because then they were also doing other stuff as well. For*

now it is more hardware – device problem than ICT platforms problem with this. Google Classroom provides what I need. I would prefer if the school could... But that is not ICT platform, but If we could have access to National Encyklopedin, if we had access to SLI, the move platform, but I doesn't fit in the topic. If you can access more of that, it is easier to give the students more when they need on their level. The high achievers can do more complicated stuff and I can give more support, easy stuff when I have those tools both hardware and software.

- 5.12. How the number of different ICT platforms on the market affects your lesson planning?
- *I think they are probably teachers who are more up to date on what there is on the market than me. I have more a content knowledge that I would like to add to the platforms and since some of the key one are not here, I am more frustrated about getting them in than looking for the new ones. And then I am not very good at... I learned about Goose Chase from a colleague, I learned about MegaSittingPlan from a colleague. Kahoot I knew myself. Citera I knew myself. But when you start thinking about it you realize how many ICT platforms you are actually using and how do I find out about it is normally from colleague, so it is not something that is stresses me, but everything time you taking a new platform, even if it is a colleague that you find out from, of course it takes more time to figure out. So more offers on the market it takes more time to process.*
- 5.13. How would you see placing all ICT platforms that you use in the school into one with all necessary features? How would that affect your work?
- *That would of course be a dream, but I think what also might happen, which what happen with SchoolSoft or Google Classroom that after a while it limits you, because you stuck in that platforms and you can't use other ideas coming from the market. If we had all including platform, which sounds like a dream it still needs to function with new ideas coming up.*

Appendix 4. Interview with Teacher 2

Date: 21/12/2022

Introduction

Do you permit to audio record the interview for the purpose of analysis of your words?

- Yes.

1. Background of the respondent

- What is your role in school?
 - *Swedish teacher.*
- What classes do you teach?
 - *Eight and nine.*
- Which subject do you teach?
 - *Swedish.*
- Are you a mentor?
 - *Yes.*
- Do you have any additional role in school?
 - *Yes, I am first teacher.*
- How long you work in IES Tyresö?
 - *Four and a half years.*
- How long you work as a teacher?
 - *Nine and a half.*
- Are you a qualified teacher?
 - *Yes.*

Upper school teachers in Internationella Engelska Skolan Tyresö

2. Characteristics of ICT platforms in education

- What kind of hardware are teachers provided with in the school?
 - *Chromebook and smartphone.*
- What are the opportunities for teachers to upgrade hardware and/or software in case of a need?
 - *I don't know. I would guess it is possible for someone to get a PC for art or.... I don't know. Maybe.*
- Who chooses the devices for the school and how teachers participate in the choice?
 - *I don't know who chooses and teachers are not participating in the choice.*
- What devices are the students provided with? Is there one on one computing implemented in the school?
 - *The students are not provided with any computers, but they can borrow chromebooks. The students use chromebooks that we have in trolleys.*
- How differentiation of interface in the ICT platforms is disturbing you in the efficiency of your tasks?
 - *I don't have difficulties with it, but it is always obvious that SchoolSoft looks older and it is ineffective in many ways. And slow.*
- How features of the ICT platforms that you do not use, but they are still active are disturbing you in your tasks?

- *You learn to not see them. You forget about them with time. You just go there.*
- Would you choose to use more apps if that could expand your possibilities and it could benefit your as the teachers and the students? Why?
- *Yes, I would. If there is an application, like there is a tool to make notes on the board, where there can be a clock up there, timer. Yeah, I could use that, if that was usable for me.*
- What ICT platforms you use during your lessons for teaching, including those that you allow to be used by the students?
- *Google Slides and Google Docs are the apps that I use the most in teaching. And also Google Classroom.*
- How is curriculum placed into different ICT platforms? Are the teachers responsible to use the platforms in the way that curriculum stands or there is support that makes the usage of the apps more efficient for the teachers?
- *Everything is already in SchoolSoft in terms of assessment. To publish assignments that it comes up as information at the right time for students and parents and then to use for me to assess the students and then publish the results. It is an administrative support that everything is there.*
- In what way the curriculum forces you to use ICT tools in your lessons? What ICT platforms are unavoidable in this process?
- *No, it is the SchoolSoft interpretation of how to use curriculum that forces me in that way. The curriculum doesn't need to be use it in that way. That could be a paper and a book and you never need to have a computer to use that document. Maybe not in this school, that is our policy, but the way to mark it in SchoolSoft matrix system that is just the platform design and the school policy that forces me to use the curriculum in that specific way. If I worked in another school that could be another way of working with the curriculum. The curriculum itself it doesn't force me to do that.*

3. Level of digital transformation of school by ICT policy

- How were you informed about ICT policy in school?
- *Lessons, SchoolSoft training, emails and work to mouth. Someone tells us in all staff meetings. In a meetings, like: this is how we should use SchoolSoft, like we don't use yellow, in some sort of Head of Department, Head of Year, or Coordinator meeting.*
- How your onboarding process looked like in terms of receiving information on IT routines?
- *In first couple of days I sat in different sessions and learned. Someone passed on all information in a structured way.*
- How often ICT policy and routines are updated?
- *Every term.*
- How you as a teacher can get access to ICT platforms used in organization?
- *I receive a Chromebook and there are the things downloaded on Chromebook automatically and everything is there.*
- How the students get access to computing during the lessons and outside the lessons?
- *In the lessons they use chromebooks that teacher borrow for the class and outside the lessons they use their own devices. They can log in to SchoolSoft and Google Classrooms.*
- What ICT platforms you use at work for what purpose?
- *I use Happeo to find things that I need as an employee like everything from leave of absence or any forms and a forms for academic action plan is in there. You fill this in directly, forms for parent meetings. Meetings for behavior or something else. SchoolSoft, where I use for teachers, I use tools for weekly planning, I use the tool to create assignments to mark assignments, to grade, assess assignments, and give feedback by SchoolSoft. In SchoolSoft I look up groups of*

students to find phone number and email addresses to parents and I check attendance in SchoolSoft. I book computer trolleys, I book times for parent meetings: development talks, and sometimes I check lunch menu. There used to be forms in there, but there are not there anymore. They moved it to Happeo. Then I move on to Gmail. That the where we communicate with colleagues, management, parents and students. There use you also other Google Workspace for Education Fundamentals like Calendar, Google Classroom., where I put some work for students sometimes. I also use Google Meet. And then we have Behavior Watch, where I create behavior notices for students.

- How often you need to place the same information many times to different ICT platforms according to the routines or your needs?
 - *Every time someone is late. It happens every single day, couple of times a day. Every time I have a lesson someone is more than 5 minutes late and I have to mark that in SchoolSoft twice. First, I put not attending and then I have to stop my lesson, when this person shows up, go back, open up SchoolSoft again, how many minutes late, change absence to late and then also put a behavior notice. That affects my lesson. That is extremely energy consuming. It doesn't work. Sometimes also you need to email parents about that. Or you have to answer an email about... The Gmail can come there too, because parents have questions. Behavior notices are not sent automatically to parents, I don't think lates are sent to parents automatically as well. When a student is absent, that goes automatically, but not lates. If the platforms were all placed into one, it would benefit the students much more.*
- Did you receive appropriate training for the usage of the app? If yes, who introduced you into this and in what form did you receive the training?
 - *Yes, I did. People who are responsible for respective platforms provided the training.*

4. ICT support

- Who is responsible in school for technical support in ICT?
 - *Mr Piotrowicz, IT representative. IT guy.*
- How you notify about a problem with ICT platforms?
 - *I send an email to IT representative.*
- How quick the support is responsive in case of your need with ICT platforms?
 - *That could depend, but usually very fast. Very quick. Often the information about problems reach me before I even notice, so it is very easy.*
- What kind of administrative support you receive in school in terms of ICT platforms?
 - *I receive sufficient support from head of my department. Every platform has a person responsible in school. Maybe apart from Gmail.*

5. Degree of harmonisation of simultaneous use o many ICT platforms

- How would you describe your personal interest in computer technology and level of your digital competence?
 - *Medium to lower medium. Not very interested in technology. I am not the kind of person, who goes out and buys the latest technology or look at stuff, but I do like it and I think I am able to use everything that is out there. I help older people, who have problem like my mother or father. But many people around me are better or more interested and think it is more fun.*
- What kind of ICT training you received during your university studies? Who provided the training?
 - *I don't think there was any ICT training in my university studies.*
- What kind of ICT training you received in your professional carrier? Who provided the training?

- *It was provided by someone in the workplace, like you for instance, the IT representative at school. Or like a guide, who was in the function taking care of teachers, like we used to have first teachers for others, we had heads of departments, heads of years and coordinators going through the basics of platforms: SchoolSoft and Behavior Watch. Training about the technology itself was offered but didn't do it.*
- Could you describe your ability to fulfill all requirements given by the organization with usage of ICT tools?
 - *My ability to do that is good, I would say. It is not that is stressful for me or something like that.*
- What areas are still challenging for you to cover in terms of using ICT platforms?
 - *The thing that you need to remember to use the platforms. Like to do weekly planning. Sometimes you can miss out on something like that. Sometimes I have forgotten to make the weekly planning, or I forgotten to publish something, because I am waiting for one student to publish the results on SchoolSoft, when I am waiting for one or two students to hand in, and I think: I am going to publish, when they hand in and then I forget. But that is more administrative difficulties in usage of those. My lack of administrative skills or ability to remember. Things like that.*
- How the number of routines with the number of ICT platforms correspond with your current workload in school?
 - *It makes my life much more complicated. For instance, you have to write comments in SchoolSoft to students and there is no help with spelling, like you have in every other application. It doesn't have it. It is a very simple tool, that little square to write in. You need to write comments to assess. You need to write comment there. I could write it somewhere else. I cannot just email the student. It should be there in SchoolSoft for students, parents, teachers to read. In different situations I need to contact the students and parents by SchoolSoft and in different situations by different tool to email the parents and contact them about something else. In SchoolsSoft you fill in the matrix and you write a comment. That is how we decided to do in Swedish department. Some other departments do it differently. But to write in that little square you can make a little bit larger, but it is not a very o good tool. It should the best tool, it should have upfilling the letters for you. It could speed up writing very, very much.*
- Please describe how you work with many ICT platforms on one device. What is your personal strategy and how did you manage to set up this strategy? Did you come to this yourself, is it an effect of IT training or something else?
 - *I used to have some many tabs, rows and rows of tabs open. But now I started closing them and now I am trying to keep only the minimum. So the tabs are reminders, almost like a "to do list", like "Oh, yeah, that tab is there, because I haven't done that. Because I was gonna write a behavior notice for that kid over there and that is why I still have it up". I figured it out over time.*
- How you cope with different features of all ICT platforms and what kind of support you require in terms of this?
 - *I use a very small percentage of all the options in each platform. In SchoolSoft for instance it is a little bit more, mostly: attendance, assessments, and there is holistic assessment, as it is called now, and then you grade there. Other than that you don't use very much. And then you have this platform now, Happeo. That is an additional. But that is new, so for now I use more and more every day. Each week things are there. When I was Head of Year, I was trying to use more features in Behavior Watch, to monitor behavior, but I could not ever figure out how to do it in the best way. I don't think it was very clear. And I asked for help from student care coordinator many times and he said it is easy, he showed me and it wasn't easy and he showed me again, and I never really got to. I wasn't able to do that very well. As a teacher I just still to the little*

few features that I need. As head of year I was struggling, trying to learn and I had hard time trying to figure out how to monitor the best way. They also change the access rights, so all of the sudden I wasn't allowed to open some features in that, because there are different levels of access.

- How using many ICT platforms affects your process of focus? Does it disturb you to concentrate on the task with a feeling that you are multitasking even if you are in one process?
 - *No, not really. It sorts things from each other, I would say. In a way it is workable. I can't compare to how it would be like to gather those things, but it would be of course much easier if you had Behavior Watch in SchoolSoft. That would be great! That affects me. It is frustrating. It also affects in the way that then the new staff come, you have to teach new people. Of course, it is a little bit more cognitive work. It takes more time and energy.*
- How you like to expand your competence after work within ICT?
 - *No. I wouldn't like that. I think they (platform designers) should work being user friendly as much as possible instead of asking the user to learn, unless I am using something that is more complexed, for example to learn all the tools in Google Sheets maybe. I wouldn't have anything against learning a little bit more those advanced systems, but for the easy systems no. They should be easy enough just to figure out directly and when you need something, you can ask someone, and you can do it.*
- How would you like to expand usage of ICT platforms in your lessons?
 - *No. That depends. Well, maybe. To you more platforms that I use already? No. Less.*
- How the number of different ICT platforms on the market affects your lesson planning?
 - *It doesn't make it difficult. I use Google Classroom and then the information is in SchoolSoft. It does affect that there are two different ones, because my students don't know, because they don't open SchoolSoft. It is very difficult. But if you have information in Google Classroom, they read it. Not everybody, but... So that is how it affects. The communication systems is not really working. You filling in something there, you write something there and no one reads it. That is how it affects the class, because there is a plan and in the end they don't know. There was a homework or whatever. And then maybe two or three students know about it. The students don't read emails automatically. I am saying the number of platforms affects the students. That is also how it affects my planning and my lessons – because it affects them.*
- How would you see placing all ICT platforms that you use in the school into one with all necessary features? How would that affect your work?
 - *That would be good. I think it would affect my work in a positive way. That would be easier, more effective, nicer. Like one, maybe two platforms.*

Appendix 5. Interview with Teacher 3

Date: 22/12/2022

Introduction

Do you permit to audio record the interview for the purpose of analysis of your words?

- Yes.

1. Background of the respondent

1.1. What is your role in school?

- *I am the Head of English department. I teach English.*

1.2. What classes do you teach?

- *I teach year eight and nine students.*

1.3. Which subject do you teach?

- *English.*

1.4. Are you a mentor?

- *Yes, I am for 8B.*

1.5. Do you have any additional role in school?

- *Yes, I am protection agent for one of the unions: LR.*

1.6. How long you work in IES Tyresö?

- *I am going into my fifth year now, so almost four years.*

1.7. How long you work as a teacher?

- *Six, seven years. It depends. Let's say it is six years.*

1.8. Are you a qualified teacher?

- *Yes.*

Upper school teachers in Internationella Engelska Skolan Tyresö

2. Characteristics of ICT platforms in education

2.1. What kind of hardware are teachers provided with in the school?

- *Computers and phones. Well... Should we count projectors and sound system in classrooms in class?*

2.2. What are the opportunities for teachers to upgrade hardware and/or software in case of a need?

- *No, I don't think so. I know last time I got broken my phone and it was replaced. I don't actually know, because in art department they needed MacBooks and they got those. But I don't know if they came from their budget or school's budget, I am unsure. But I would say no that I am aware of.*

2.3. What devices are the students provided with? Is there one on one computing implemented in the school?

- *No. They are provided with computers from the trolleys when teacher books it. And there is a limited number. There is not enough for everyone in the school.*

2.4. How differentiation of interface in the ICT platforms is disturbing you in the efficiency of your tasks?

- *I think when there are too many links that we don't use. That gets a little confusing. So you know... When you click on student document there is one thing that I use there, and when you click on mentor document there is one link that I use there, but there are five different options. And it feels... I guess it doesn't hinder you anywhere, but it does explaining to new staff difficult*

to... It is difficult to keep track of where each thing is in the beginning if you are not used to it. If you have done it couple of time it is not less annoying, but at least you know where to find it.

2.5. How features of the ICT platforms that you do not use, but they are still active are disturbing you in your tasks?

- *It doesn't disturb, but it does make you wonder why those features are there. Is it something we are not using, that we should be using? Yeah... I guess it feels unnecessary. If we are not using them, then they shouldn't be there. And if they are there I think we should know why.*

2.6. Would you choose to use more apps if that could expand your possibilities and it could benefit you as the teachers and the students? Why?

- *Yeah. So if I think about my subject we cover quite a few things in language, right, and we look at phones and we look at newspapers, we look at books and we do visual studies, and those things come from different sources and different platforms. So I think hunting around for the best system does take quite bit of planning when I do my unit planning. I do spend quite bit of time looking for good resources to use in class, which I am quite happy to do. Well, if I had a choice, I would choose to use fewer with a good variety. But it feels that is a bit unrealistic expectation. But if you think about a provider like Google, they have so many different resources and I guess maybe going back to the training would be nice to know what they have in their offer. I know that colleague of mine use their Google Websites and that works really efficiently for their classes. Some of the platforms that we use have a lot more to offer that we are taking advantage of. So it would be nice to know what the few platforms we do have in offer instead of using many different apps.*

2.7. How is curriculum placed into different ICT platforms? Are the teachers responsible to use the platforms in the way that curriculum stands or there is support that makes the usage of the apps more efficient for the teachers?

- *Again, it has become a bit more complicated now with new curriculum. Since they are all lumped together. Because now we click the box, it is already there, so if you say knowledge requirements, you click the corresponding box, but before it was broken up to different sections. So now I click one box that has four different sections and if I test only a small part of that, I also need to go and copy that somewhere and paste it to the description. Before it was also translated into English. Now it is not. So we have a separate document, where we have our grading criteria translated to English and that is the one that I use to copy and paste. I think lumping together made it more complexed. I understand enough Swedish to be able to figure it out, but I know we have quite a few teachers who don't. And then not being readily translated into English has made it for them a little more, maybe not nerve-racking, but maybe more stressful if you going to click the box to know that you are clicking the right thing.*

2.8. In what way the curriculum forces you to use ICT tools in your lessons? What ICT platforms are unavoidable in this process?

- *It is part of our core content, actually. Digital media. So we are expected to help students to allocate different ICT platforms. Yeah, our core content is focused, as I mention before, on loads on different aspects, so phone is included, news reels and things like that are included, and you can't have access to that without being on different ICT platforms. So I think just the nature of our subject is very much linked to digital media.*

3. Level of digital transformation of school by ICT policy

3.1. How were you informed about ICT policy in school?

- *I think a lot of it is trial and error. I know, when I started here and that was February, that was a random time, so I had to find my own way through SchoolSoft and then, you know, you do something and people are like: oh now, that is not the way you should do it. And then it was a*

lot of that. A lot of trial and error. And I am seeing now the same thing is my department that people are doing things in a certain way and then get told: oh, that is not the way we do it. If we think about yellow boxes for example on SchoolSoft, that is a valuable tool, but because the people don't know how it use it, we are all told that no one should use it. So I don't think that is an effective way to do it. I think it is a very simple thing to teach people, if we had some sort of a course.

3.2. How the students get access to computing during the lessons and outside the lessons?

- *During the lesson computer trolleys. Outside of lessons... We sort of assume, I guess, they all have a computer or phone at home that connected to internet. I have tried to push for computers in library, so the students are able to go to library and work on project there. I think we just assume that they have access, which is not necessarily the case.*

3.3. What ICT platforms you use at work for what purpose?

- *Google Workspace for Education Fundamentals, SchoolSoft, Behavior Watch, Happeo... I use Google Sheets, Google Slides, Google Classroom. Quite a bit of YouTube, I think those are the one I can think of on top of my head. Hogia once a month.*

3.4. How often you need to place the same information many times to different ICT platforms according to the routines or your needs?

- *Oh Jesus... Yeah, without lesson planning we do that. Like the weekly planning that we have to do. We have to post that to several different platforms and I guess it is a bit frustrating, because the kids are always asking: can't you just post it to Google Classroom, because that is the one they use. But then we have to put it on SchoolSoft, so we tick some sort of administrative box. So that is one for grading... The students are confused with information flow. They know where to find the information, but a lot of them don't know how to use more complexed system like SchoolSoft. I know a couple of kids that I tell them: it is on weekly planning, and they still ask, grade 8 and grade 9, how do I find that? It is not that they don't know where the information is, it is just too complexed to get the information they need quickly and easily, so they prefer simpler, none nonsense, interface like Google Classroom.*

4. ICT support

4.1. Who is responsible in school for technical support in ICT?

- *You are! Mr Piotrowicz, our IT manager... IT representative.*

4.2. How you notify about a problem with ICT platforms?

- *I email Mr Piotrowicz, our IT representative.*

4.3. How quick the support is responsive in case of your need with ICT platforms?

- *Very good. I think our IT representative usually fixes a problem in under an hour.*

4.4. What kind of administrative support you receive in school in terms of ICT platforms?

- *The actual functioning of ICT platforms that we get from IT representative that is pretty simple. But the day to day, how to do things, and those needs to do things and when and why, that is a little bit confusing. If I think about new teacher for example, then we have First Teacher who is in charge of new teachers... I thought that managing through those things is part of their responsibilities, but it turns out that it is not. So then I think for new staff especially here might be a lot of gaps, because it is a bit unclear who is in charge of helping new staff with what.*

5. Degree of harmonisation of simultaneous use o many ICT platforms

5.1. How would you describe your personal interest in computer technology and level of your digital competence?

- *Oh, good question. I think that I can figure out the basics of most computer programmes. But then there are all these hidden features that I wished that I know about. I am pretty confident*

how to use the basics, but how to use them smartly that is a different question. I don't know if I have enough knowledge to be able to figure out all the nitty-gritties and all the cool things that the applications can do.

5.2. What kind of ICT training you received during your university studies? Who provided the training?

- *We did loads of computers skills at school and then we did computer training at university as well, how to use key words and source criticism. It was mostly focused on that. And then at my first school we had Excel quite a lot, because we used it at school that I worked at. So we had some Excel training from our IT manager at the school. So everything at the surface level.*

5.3. What areas are still challenging for you to cover in terms of using ICT platforms?

- *I think keeping track of where you have put what data, I guess. So you upload this thing to Google Classroom and then you need to link it to SchoolSoft somehow and I found out the other day that we shouldn't link pdfs to SchoolSoft, because it is limited with space that you can take up. So that was something new for me as well. Because if you are not linking pdfs that you are making, your links are public to whoever with the link, which I am not comfortable with, especially if it is still a living documents and you are still changing things. Then it is a little bit annoying that you can't just rely on one platform to be able to manage with all the things associated with teaching and school.*

5.4. How the number of routines with the number of ICT platforms correspond with your current workload in school?

- *I think it has increased this year as well, since we have moved to new curriculum and on SchoolSoft especially our subjects rubrics or grading criteria now have been squished together, when before there were broken up to different sections, which means that I can't rely on SchoolSoft to do my grading, because it is not settle enough. So now I have a separated spreadsheet on my own, where I import the grade that the child to get as well as in the specific areas they need to improve and in SchoolSoft I click the lowest box. So it felt a little bit this year with everything being squished together and the lack of new once the workload has increased and we are now clicking boxed for the sake of clicking boxes.*

5.5. Please describe how you work with many ICT platforms on one device. What is your personal strategy and how did you manage to set up this strategy? Did you come to this yourself, is it an effect of IT training or something else?

- *My strategy is usually to print out one document and then to make sure it corresponds to the other platforms. So as well now with putting grades. I am talking a lot about putting grades, because that is what we have done recently. I print out my spreadsheet and I make sure it looks the same in SchoolSoft and looks the same where we important the grades and everything. I think I rely a lot on physical copies.*

5.6. How using many ICT platforms affects your process of focus? Does it disturb you to concentrate on the task with a feeling that you are multitasking even if you are in one process?

- *Yeah, like I said before it is tough to keep track what you are doing where. So where I might think that yes, my grading is done because I have updated it on my platform and on my spreadsheet and I know what is going on I might forget to put in on SchoolSoft itself, which is the problem for administration, because it looks for them that I haven't done my job. So it is doubling the workload and you know, if you have too many tabs open it is easy to miss something. So keeping track of what you are doing and where you are doing is becoming a little bit more complicated.*

5.7. How you like to expand your competence after work within ICT?

- *Oh, I would love that. I think I have suggested it before that we should all have this as a part of in-service day, to have a training session. It is the same with parents. They often ask: how to do*

this, how to log on. And I don't necessarily know to help them, since their interface looks different to mine. And I don't think I have ever seen their interface, so I don't have any idea how to help them either.

5.8. How you benefit from using ICT platforms in your lessons?

- *I can see a lot of pros for that. I don't know if we have enough resources to be able to do that. I have found that the kids here have less knowledge of how to work with computers. We think they are digital natives, because they grow up with social media, but they don't know how to put a word document into columns, and they don't know how to write with appropriate font. So there is a lot of very basic things that they don't have. So the couple of time I have had them write... Once we had to write a newspaper project for example, and then we had to put things in columns and half of my lesson was to explain them how to do something that basic. So it would be great to be able to work with things like that, but I think especially in lower years, in year 4 and year 5 they would need some computer training skills before they could do anything effectively.*

5.9. How the number of different ICT platforms on the market affects your lesson planning?

- *My lesson planning I would say not so much, since I rely mostly on Google Slides. So I plan and do all my lesson on Google Slides and I upload that to various platforms. So that is not such a big issue for me. I thin relating to your questions to the market and everything is that is out there I simply just don't know. So I use whatever I am told to use. But I don't really have any sort of knowledge if there is a bit a system out there.*

5.10. How would you see placing all ICT platforms that you use in the school into one with all necessary features? How would that affect your work?

- *That would be ideal. That would make it a lot simpler and I think I forgot about the Happeo entirely. We have our building reports in there and we have also things like our action plans and things out there. I think a lot of times people just don't get to do those things, because it is another click away. Myself I know that when we had our building reports in Behavior Watch last year I used it a way more often, because it was much easier to find. Happeo, I think, is a different kettle with fish, because I find it very frustrating to work with. There is too many tabs and then you are in the wrong school... It is just way too confusing to make it effective in any way. It would be much better if that was streamlined.*

Appendix 6. Interview with Teacher 4

Date: 22/12/2022

Introduction

Do you permit to audio record the interview for the purpose of analysis of your words?

- Yes.

1. Background of the respondent

- What is your role in school?
 - *I am Head of Math department. I am also grade 8 and 9 teacher.*
- What classes do you teach?
 - *Eight and nine.*
- Which subject do you teach?
 - *Math.*
- Are you a mentor?
 - *Yes. 8C.*
- Do you have any additional role in school?
 - *Yes, I am also a first teacher. My first teacher project is classroom management.*
- How long you work in IES Tyresö?
 - *This is my sixths year within the school.*
- How long you work as a teacher?
 - *Six years.*
- Are you a qualified teacher?
 - *Yes. In Canada.*

Upper school teachers in Internationella Engelska Skolan Tyresö

2. Characteristics of ICT platforms in education

- What kind of hardware are teachers provided with in the school?
 - *We are provided with a school computer and a school phone.*
- What devices are the students provided with? Is there one on one computing implemented in the school?
 - *Student who have different diagnosis they can get one on one computers, but not every student in school has one. There are a number of computers that teachers can book for lessons. Where student can have one on one computer for a certain hour when they do a certain project. For the most part it is just the students that actually need computers to pass certain subjects. They need computers to help them, I guess, in certain subjects.*
- How differentiation of interface in the ICT platforms is disturbing you in the efficiency of your tasks?
 - *I have never been good with change, but usually when I know how a certain platform works, I can do what I need to do, but if it is a new platform that I have never been on, that I am just explaining, I would have to do some work over the weekend. I would never open a new platforms in front of a class, because being a little bit weak with technology could take 30-40 minutes just to figure out what I need to do to open whatever it is to needs to be open. If it is a new and different looking platform or it is a brand new platform to me, I would definitely need to take*

some time on my own to figure out before I would feel comfortable maneuvering through, I guess.

- How features of the ICT platforms that you do not use, but they are still active are disturbing you in your tasks?
 - *Different feature, especially when I am not using the features, yes... It is just to look at, more places to get lost, especially, when you do not know what you should be doing. If there is added features that I am not going to use, smartwatch, iPhone, for me, when I am pretty simple, the 80 percent of stuff that I have on those devices, I don't use them anyway. I think it a nonsense when you are not really familiar with how those apps work.*
- How is curriculum placed into different ICT platforms? Are the teachers responsible to use the platforms in the way that curriculum stands or there is support that makes the usage of the apps more efficient for the teachers?
 - *Curriculum is definitely in the Google Drive. I don't know if it is on SchoolSoft, but it is definitely in the Drive. And then we have different academic coordinators, academic vice-principal and they have always sent to staff by email. Not just the Swedish version, but also translated English version too. It is fairly accessible, especially, if you need it. If you can't find it, which most people can, you can always send an email and you will get it in less than five minutes. It is definitely in Google Drive, that is where I find it.*
- In what way the curriculum forces you to use ICT tools in your lessons? What ICT platforms are unavoidable in this process?
 - *The curriculum, especially the new one, there is bigger focus on technology for sure. They want students to be more familiar with technology because it is an important thing. They even added a technology class and a lot of math curriculums now in the end of the year are supposed to be two of three weeks coding, a unit that students are supposed complete as week. If you are not using ICT platforms, when you are teaching students, they I feel like you definitely you are doing them a disservice.*

3. Level of digital transformation of school by ICT policy

- How were you informed about ICT policy in school?
 - *When I first started it was the IT person, that gave us small tutorials how to run different platforms. And from there it is just the longer you work, you learn from your department, you learn how to put things into SchoolSoft, you learn how to put assessments into SchoolSoft, over the years you get more and more familiar with things. And of course if there is a new platform or new things that come again there is usually the IT person in the school that notifies the staff and then it is some sort of tutorial and how to get more familiar with it.*
- What ICT platforms you use at work for what purpose?
 - *SchoolSoft is recording students attendance, contacting parents, storing contact information I needed, weekly planning. Google Drive that is just Google Slides, Google Sheets and that is just for lesson planning. Behavior Watch is that to monitor students' behavior. Happeo that is more to record students behavior, student progress. Hogia that is where you look at how are your absences and payslips and stuff like that.*
- How often you need to place the same information many times to different ICT platforms according to the routines or your needs?
 - *Weekly planning is where students can go to see what they are going to do each lesson, but on top of that we started added actual lessons to Google Classroom as well, so it almost feels like we double dosing the students there and sometimes we have to email the lessons to students personally, because they can't get in to Google Classroom, because of lack of password or*

whatever. So definitely if it not every single day, it is probably at least sometimes to put all the lessons up on Friday or Monday, so if it is not two to three times a week it is once a week for sure.

4. ICT support

- Who is responsible in school for technical support in ICT?
 - *IT manager, maybe?*
- How you notify about a problem with ICT platforms?
 - *I would send an email or call.*
- How quick the support is responsive in case of your need with ICT platforms?
 - *Fairly quick.*

5. Degree of harmonisation of simultaneous use o many ICT platforms

- How would you describe your personal interest in computer technology and level of your digital competence?
 - *My level of digital competence is very low. I am not very good with computers. I know how to use the programs that I need to use to do my job.*
- What kind of ICT training you received during your university studies? Who provided the training?
 - *During my education degree there was not much computer training at all. When we started working in a school they taught how to use the systems that were supposed to be using. Later my job, when I started working at IES Tyresö, again we had another introduction to SchoolSoft, which is a platforms that we supposed to use. I think most people have a fairly good understanding of Google Workspace for Education Fundamentals. There were few things that we had to learn from it, but the more you work, there more familiar to get with different platforms. That helped me.*
- What areas are still challenging for you to cover in terms of using ICT platforms?
 - *Again, I am not super strong with technology, so sometimes if I have to lesson planning, if I have to plan a certain lesson with Google Slides on Google Workspace for Education Fundamentals, sometimes it is hard to put things in presentation. I am not very good with presentation when you have to have difficult things. You know, difficult things to stick in. Another thing that is a little bit difficult is the new platform called Happeo. When you are not super familiar with things it could be difficult to find whatever you are looking for. Whenever you need to have some sort of a read up about a student or whenever something is broken and report that. So sometimes things like that can be a little bit challenging, because you want it to take 2 or 3 minutes, but it takes 10 minutes just to find the actual form and then takes another 3 or 4 minutes to fill it out. So a 2 minutes job takes 15 minutes to complete. So it is more time consuming that you would like it to be, I guess.*
- How the number of routines with the number of ICT platforms correspond with your current workload in school?
 - *I think some teachers will testify that some days you wish you had your personal secretary. I think at times you kind of forget how much things weather it is personal information your dealing every day. Wherever it is in SchoolSoft, Happeo or Google Workspace for Education Fundamentals, or email, wherever it is. There are few different things that if it was in one place it would be a little bit easier to get access to. At the same time you have to kind of remember it is not too difficult to open it up, get it from where it to be, and fill it out. I have never really thought about it, I guess. How many platforms we have, because I still feel that is only three or*

four, to be honest. In a way that is good. I think the bigger issue for me is trying to find a certain document on Google Drive. This sometimes can be a bit stressful, because if you haven't pull it out for a while, it could be hurtful.

- Please describe how you work with many ICT platforms on one device. What is your personal strategy and how did you manage to set up this strategy? Did you come to this yourself, is it an effect of IT training or something else?
 - *When I started everything went into my drive, but last couple of years we were putting everything to a drive where everyone in IES or at least everyone in my department has access to. Just so it is more public, so people can give and take things. So now a lot of stuff goes to shared drive, which gives access to for everything in maths department, which is good, but when you actually go into the drive it is very tabbed off. It is one tab to the next, it almost feels that you have to go in to ten different tabs just to drop one thing in, whenever it is maths, grade 8, unit test, ect. So that is a little bit time consuming, but I think the bigger issues with Google Drive is that you can't delete anything. There is just so much stuff in there, like I have stuff from the first week I worked here. That is kind of annoying too, because there is so much stuff that I don't need anymore, that I just wish to get rid of. I don't use Happeo that often. I know that depending on what role you have in school, there are people that are on Happeo 8 to 10 times a day, but SchoolSoft I am on a lot. Most teachers, we have to do attendance there, we need to do weekly planning there, so I ma on SchoolSoft probably 8 to 10 times a day taking attendance and stuff like that. Happeo only if I need to report something or if I have a meeting with a student that needs to be updated or the student needs to be reported in the system. SchoolSoft is definitely the most popular, I think. SchoolSoft and Google Drive. Because Google Drive is day to day lesson planning, here is the next lesson, teaching students and then SchoolSoft is basically, you know, when you are in school contacting parents, to do attendance, everything needs to be reported through SchoolSoft, where Google Drive is where you do everything personally and you teach.*
- How using many ICT platforms affects your process of focus? Does it disturb you to concentrate on the task with a feeling that you are multitasking even if you are in one process?
 - *95 percent of the time I know what I am doing. There is that time when you try to open a lesson, and then you go to SchoolSoft and you say: oh, wait, wrong place. But no, 95 percent of the time I kind of know where I am going, so it is not too bad.*
- How you like to expand your competence after work within ICT?
 - *I think learning, especially now, when IT became so important, it is the new thing, the more often you come with a computer, with technology, it could open more doors. I would for sure like to, if I could, take some professional development, courses or classes. More in the evening, but I would definitely would like to be more familiar with things like IT and technology, because I feel like I am not very good with it.*
- How would you like to expand usage of ICT platforms in your lessons?
 - *Yes, there a few different things, that we can use when we have for example a fun lesson sometimes. There is few different website that we use. Kahoot is very popular, but it is not as effective now. There is few platforms that we can use that students are starting to enjoy more and more. Sometimes you have to break a lesson up. I don't want to use the exact same Google Slide every single lesson. Students need some sort of variety from time to time. It is good to have fun and get the students to engage with not academic work. Sometimes with a break lesson or catch up lesson or activity day or whatever it might be. But in terms of IT there is a few different things I would use, but again these different platforms that I am using I would probably only use. There is 5 or 6 times in a term. Maybe 10 times in the whole year.*
- How the number of different ICT platforms on the market affects your lesson planning?

- *Usually when we have professional development days or conferences, when we get to different schools and we can learn from different people, there is always usually new websites or you know: oh, I use this, I use that, this is really good site for middle school math teacher. So sometimes we can take those and write them down or send email to myself and I can check them up on the weekend and see what they are like. That is usually effective but in terms of actual websites now it is getting to a point when it is always scary. You can go to certain websites and students can literally, they can get essays, computer will solve you math problem and will show you exactly how to do it, even these websites make the language to feel like grade 6 student, if they tell them that they are grade 6 or grade 8 student. So subjects like in Swedish, English and SO they have a hard time deciding if this is actual a student's work or it is something they copy from internet. I am not super familiar with all the platforms, but I definitely know that there is lots of different platforms or there is lots of different things that are making schooling in general a lot easier for students.*
- *How would you see placing all ICT platforms that you use in the school into one with all necessary features? How would that affect your work?*
- *I don't know. I feel like if you put everything in one there would be a huge mess. It might be quicker to access certain things, but I definitely think the would be a learning curve. Especially after throwing all information into one. Because Google Drive itself.... You know. I struggle with that trying to figure out what I am trying to find and where I can find it. So putting it all into one, like I said, it might be a little bit quicker just to go between SchoolSoft Behaviour Watch, Happeo, but I feel like it is definitely it is going take some time to figure it all out, because it could end up being a huge mess. I am not sure what other people would think about that.*

Appendix 7. Interview with Teacher 5

Date: 22/12/2022

Introduction

Do you permit to audio record the interview for the purpose of analysis of your words?

- *Yes, I do.*

1. Background of the respondent

- What is your role in school?
 - *I am a music teacher and then First Teacher for music and events.*
- What classes do you teach?
 - *Grades 7, 8 and 9.*
- Which subject do you teach?
 - *Music.*
- Are you a mentor?
 - *Yes, I am.*
- Do you have any additional role in school?
 - *First teacher to help with events, Lucia, Graduation, concerts.*
- How long you work in IES Tyresö?
 - *Five years.*
- How long you work as a teacher?
 - *Twenty-eight years.*
- Are you a qualified teacher?
 - *Yes.*

Upper school teachers in Internationella Engelska Skolan Tyresö

2. Characteristics of ICT platforms in education

- What kind of hardware are teachers provided with in the school?
 - *We have a laptop and a phone. Chromebook more particularly.*
- What devices are the students provided with? Is there one on one computing implemented in the school?
 - *We have trolleys that we need to book in advance. So not every student has the access to a computer in every lesson. Then I have purchased personally for music department. We have iPads, we have a set of iPads for the whole class. We have one stack of iPads, but we don't book it. We verbally agree who book it and when.*
- How differentiation of interface in the ICT platforms is disturbing you in the efficiency of your tasks?
 - *Frustration comes up a lot. It is when you don't know... By now I am quite familiar with SchoolSoft and Behavior Watch, so I know what I am looking for when I am there. But Happeo, I know I am supposed to find in there, but it is frustration when you don't know. There is so many questions: where is the information only for IES Tyresö, where is the information that is for all of IES? It is very confusing; it is a bit of a jungle. It is because they look so different, so you go in assuming that you will find something there, because you found it in another application, but then it is not there. And then another thing is that if you open the app, and it*

looks different that it looks in your phone. Let's say you need to log in on your phone, so maybe you are checking out who is going to be on cover tomorrow, and then you can't find it.

- How features of the ICT platforms that you do not use, but they are still active are disturbing you in your tasks?
 - *No when I know what I am doing. They don't, when I know what I am doing. But of course when you try doing something new and you are trying to figure out how to do it and they you have to go through all these option that you never heard or never seen before. I think that is when it gets annoying.*
- What ICT platforms you use during your lessons for teaching, including those that you allow to be used by the students?
 - *It is mostly different Google things: Google Slides, Google Docs and then in music we do use YouTube and Spotify quite often.*
- How is curriculum placed into different ICT platforms? Are the teachers responsible to use the planforms in the way that curriculum stands or there is support that makes the usage of the apps more efficient for the teachers?
 - *We just need to check boxes in SchoolSoft. Curriculum is when you do your planning and assignments. Then you can find both the central content and the knowledge requirements. They are both there. But they quite often I do also copy and paste it to the plan as well, so the students can see. Because in the assignments, when I have don't have all the information that I have for the assignments myself, I don't see the student can see them as well. So I tend to copy and paste them in an old fashioned way.*
- In what way the curriculum forces you to use ICT tools in your lessons? What ICT platforms are unavoidable in this process?
 - *I think actually, you can run a music lesson without anything. You could run it without any app. It is my choice to lighten up teaching and use it. I do have a lot of lessons, when I don't even turn the projector on due to nature of the subject.*

3. Level of digital transformation of school by ICT policy

- How were you informed about ICT policy in school?
 - *We have some of those training sessions, like for example now at the grading change where academical coordinators are showing us how to look in SchoolSoft. So, by staff. But we don't talk about it that much. Some of those things, like in SchoolSoft for example, I know there is still many things people can do, and I can't how to do them.*
- How your onboarding process looked like in terms of receiving information on IT routines?
 - *It is a bit random. I don't think it is very organized. It is almost like on a "need to know" basis, when you realize: ok, I want to learn how to do this. It is then me, who goes to somebody: hej, teacher, I heard you know how to do this, can you show me? Rather than somebody would: this is SchoolSoft, this year, they have this update, this is how to use it. You would then find out in all staff meeting: oh, I can do that. Yeah, but how?*
- How the students get access to computing during the lessons and outside the lessons?
 - *They only get access if we book computers. It is quite tricky in our school, so I try to minimize that. I do one project a year where we need to have computers and then we try to get by with the iPads, so we do out music work on them mostly.*
- What ICT platforms you use at work for what purpose?
 - *SchoolSoft for planning, attendance, contact with parents, grading, so kind of day to day stuff is SchoolSoft. Then my actual lessons plans, nitty-gritty lessons that happens on Google presentation and document side of things. Then Behavior Watch for the behavior, mentor*

contact, login. Happeo is for I supposed day to day when you look for admin things and documents are there. Of course, YouTube, Spotify, but I supposed for me those are the ones that come up the most.

- How often you need to place the same information many times to different ICT platforms according to the routines or your needs?
 - *Reasonably often, because you tend to... All your planning needs to be in SchoolSoft, but then the actual planning and the information that students needs to have is often in my presentation, so then I need to put the presentation onto SchoolSoft for them to access that. But then the presentation will be also in Google Classroom, because they also like to use the google Classroom. And then again the link to Google Classroom also is going to be on SchoolSoft. So there is a lot of cross reference to make sure that everybody has the information they need for everything.*

4. ICT support

- Who is responsible in school for technical support in ICT?
 - *Mr Piotrowicz. He takes care of computers, fixes the trolleys when there are problems. I assume he is the one that orders the stuff we need. And then we ring him when we can't work things, but also whenever there are problems. He lets us know whenever there is a problem.*
- How you notify about a problem with ICT platforms?
 - *It depends. If the internet is working then by email, but if the internet is not working, then by text message, also could be by the phone, if there is reception.*
- How quick the support is responsive in case of your need with ICT platforms?
 - *The notifications come quickly, so normally you notice, within minutes we know that it is not only my problem that the SchoolSoft doesn't work. I think the problem solving depends on what it is. If it is a central problem, then we need to trust other people. I think it is reasonably good. We never going to get the whole day without having access to SchoolSoft. They are reasonably good in figuring out what goes on.*

5. Degree of harmonisation of simultaneous use o many ICT platforms

- How would you describe your personal interest in computer technology and level of your digital competence?
 - *I don't rate myself very highly. Some things super good at, like when it come to music. I am very good at notation software and things like that. And I can do all the basics. Absolutely, like to write documents, emails, basic things like that. I have learned all the things that we need to use for work. I don't take particular enjoyment in it and quite often struggle a little bit.*
- What kind of ICT training you received during your university studies? Who provided the training?
 - *In university not that much. It was pretty much to yourself. We were tutored how to use word programs how to handle our work. But later on in uni I did courses on Garage Band and then other music software. Some of them are outdated, so we don't use them anymore. These things I got courses at.*
- What kind of ICT training you received in your professional carrier? Who provided the training?
 - *Some of it was in school when I was getting my qualifications, some of them were required for secondary school teaching. And then some of it was... for example when iPads first came out, I was offered a course, when I was already teaching to use Garage Band feature for special education needs and make music more accessible for kids.*
- What areas are still challenging for you to cover in terms of using ICT platforms?

- *Almost everything. I find it really hard to find the data I want. I find it often hard to navigate through websites. I know exactly what I need, but then I don't know how to get it. I could be a little bit both: it is complicated, and it is the number of ICT platforms. I think the problem is, because they are all different. Sometimes I know that I need to go to settings and I need to go there, but in another app things might be in a different place. Even in a same phone if you have the same phone and different generations, you need change a setting, sometimes they put it in weird places, from my perspective. It is just doesn't make sense.*
- How the number of routines with the number of ICT platforms correspond with your current workload in school?
- *I don't take it too seriously, so I supposed if I did exactly they want me to, I would spend a lot more time on it. It takes up a fair bit of my time just to make sure all the planning is in all folders it should be, then SchoolSoft for grading, attendance, and whatever information you need to find in there. Yes, it takes a fine bit of time.*
- Please describe how you work with many ICT platforms on one device. What is your personal strategy and how did you manage to set up this strategy? Did you come to this yourself, is it an effect of IT training or something else?
- *Quite chaotic. I am one of those teachers who have sixty four tabs open at the same time. Quite often I just work on one device. I found that some of those apps that I work on different devices, they don't work in the same way, so mostly I work on my computer. I just tend to open up all the things that I need and then I have them in one row and then I go from one window to the other. For example, if I am cross referencing or grading or something. The number of apps we may need to use to access certain amount of data does annoy me. Like if you try to get something done and then you need to open SchoolSoft for that and then Behavior Watch for another thing, but then you need to go back to Skola24 and check out another thing from the. Yes. That frustrates me mostly.*
- How using many ICT platforms affects your process of focus? Does it disturb you to concentrate on the task with a feeling that you are multitasking even if you are in one process?
- *Yes, I get really annoyed. It does disturb me and it does take concentration away. I think the biggest thig for me is then I start double checking everything. Especially, when you are going through something important: like grading, looking at student attendance or behavior issues and you start going through different platforms or sending subject warnings and what information to put where. And you need to go to different places to check what you have done and what you haven't. I do give up occasionally. I am really poor writer of behavior notices, because I don't have the patience to go, open up, sign in... It would have to really serious to put up a behavior notice.*
- How you like to expand your competence after work within ICT?
- *That is a good question. I think problem solving. When things go wrong, and something doesn't work I am completely clueless. I don't know where to even start. You know, like signing in or anything that goes wrong or something doesn't work, then I don't know were to even start.*
- How would you like to expand usage of ICT platforms in your lessons?
- *Yeah, that would be good. That would be cool and really nice. I quite like working with Google and doing presentations and that, because first of all it does save automatically, which is very handy. But I don't think I am making the best use of it at all. I think my skills are old fashioned and boring and hard to follow, because I don't make the use of different features. So that would be nice, actually.*
- How the number of different ICT platforms on the market affects your lesson planning?

- *When I am planning the lessons... It doesn't come that much. I supposed or me it comes to using different Google things that you use for lesson planning. I think it would be great to have more and I have had thing conversation many times with academical coordinator that in music it would be great if we could have the use of MacBook, if we had that and would could work with computers... That would add to my... If we could better use the iPads, because you can't cast and show everything to the whole class. That would really make my life easier.*
- *How would you see placing all ICT platforms that you use in the school into one with all necessary features? How would that affect your work?*
- *I think I would like it. I would personally prefer this. If everything was in one place, then it would be only one place that you would have to learn how to use and then all the data, everything... I would assume that what would happen is that data would be easier to transfer, you wouldn't have to do all this cross referencing and going over. I would not have so many tabs open. I personally think it would make it quicker and easier. Also, I would be better motivated to use it properly. I get a little be stroppy, when you have to like: oh... this one is in Happeo, and this was in... It would be better motivational context.*