Parents' perception of technology in a Swedish kindergarten and technostress amongst preschool teachers

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Abstract

The new changes in the Swedish curriculum for the educational system demand more digitalization in the kindergartens. However previous studies have shown that the current level of handling technology amongst preschool teachers in Swedish kindergarten is low and may create difficulties in their work. This thesis investigates a kindergarten that wants to implement a mobile app for more transparent and effective communication between preschool teachers and parents. The aims are to highlight the common perceptions and expectations from a parental point of view concerning a mobile app for communication while establishing if the preschool teachers experience technostress at their work. The data were gathered from conducting interviews and one online survey. The main finding of this study was that preschool teachers and parents should be more involved in the process of finding a suitable mobile app so they would be motivated to contribute to better daily communication. This study suggests that the most important strategies for implementing a mobile app for communication are to inform, educate and involve all the concerned parties.

Keywords

E-communication, mobile phone application, preschool teachers, parents, technostress
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**Definition list**

**E-communication** refers to the transfer of data, writing, sounds, images, video sent via an electronic device, for instance, smartphones, tablets and computers. All electronic devices that support an Internet connection can upload and share videos, images and information with other Internet users. (Reference, 2019)

**Mobile phone application** or **mobile app** is a software program design and coded to operate on smartphones and tablets. The most usual operating systems for mobile apps are Android, IOS and Windows. Mobile apps are purposely designed for different tasks and works. (Can, 2016)

In this thesis, the term **ICT** (Information and communication technology) is the collective name for the technical tools that affect the level of technostress on people. ICT includes the Internet, TVs, tablets, smartphones, computers, software, mobile apps etc. (Al-Maadadi & Ihmeideh, 2018).
1 Introduction

Nowadays most people in Sweden have a mobile phone, computer or tablets (with internet connection) that provide us with means for communicating and saving relevant information. We are getting more dependent on technology in our everyday life, and this trend is continually growing, as we use more technological tools for assisting us in our private and professional life. (Tillå, 2018)

One of the Swedish government intentions is to create a society that is world-leading in using the possibilities of digitalisation. Recent changes in the 2018 curriculums for kindergarten and elementary school education added for the first time an articulation regarding technology. The educational system now has a fundamental role in developing the necessary knowledge and capability for using digital technology. Additionally, they need to create a framework that helps students and teachers to understand how digitalisation might affect the individual and societal development. (Utbildningsdepartementet, 2017)

In several countries the education establishment urges parents to contribute to school management and build effective communication channels between parents and teachers to improve educational performance. When parents and teachers communicate regularly, conflicts may occur. Causes of conflicts between parents and teachers may be a lack of effective communication and incomplete information. As ICT develops rapidly, it is already a trend that e-communication is replacing traditional paper and oral communication. Increasing opportunities to communicate and using more efficient communication tools reduces confusion and disputes between parents and teachers. (Ho, Hung & Chen, 2012)

According to the Swedish school inspectorate, many preschool teachers express an uncomfortable assessment when using technology (Hedlin & Gunnarsson, 2014). Craig Brod (1984) introduced the concept of technostress, the inability to cope with new computer technology. During the last decades, this term has expanded to include a new type of stress experienced by users in organisations related to ICT. The definition of technostress is the constant attempt to deal with evolving ICTs and the changing social, physical and cognitive responses demanded by their use of ICT (Brillhart, 2004).

Furthermore, recent studies have been focusing on a new framework of technostress, which is about the use of technology. It’s defined as all negative opinions, emotions and attitudes employees have when they cope with new technology. Many employees may experience stress from technological developments. The constant new digital innovations can produce a negative view of computer-oriented technology. This is caused by indirect or direct attitudes from humans on their actions and mindsets. It can create a fear of using ICT and consequently make you feel hostile against new technology (Çoklar et al., 2016, p 74). There are numerous factors associated with technostress. Technostress inhibitors are factors that reduce the level of stress such as having technical support. Technostress creators
increase the level of technostress and multitasking is an example of a possible technostress creator. (Tarañdar, Bolman Pullins, & Ragu-Nathan, 2014)

### 1.1 Problem statement

Previous research has been done in the field of technostress, but there is still a need to examine what effect technostress has in different workplaces. Primarily to form an estimate of which professions are at the most risk of being exposed to technostress. (Atanasoff & Venable, 2017). The recently added articulation regarding technology in the Swedish curriculum for kindergarten and elementary school education creates a different structure of working as a preschool teacher. This thesis investigates a kindergarten that wants to implement a mobile app for more transparent and effective communication between preschool teachers and the parents of the children attending the kindergarten. So the preschool teachers could continue doing some of their main-tasks such as pedagogical planning and documentation, without spending extra work hours at home and reducing the overall workload. What are the expectations and requirements from the parents concerning new technology in kindergarten? Which functions in a mobile app are most valued by parents and why so? Moreover, explore if technostress is connected to the current level of stress that the preschool teachers may feel. These are some of the subjects this thesis aims to uncover.

### 1.2 Aim and Purpose

This thesis explores the case of preschool teachers and parents’ perceptions of used technology in the kindergarten. The aim is to explore if technostress exists amongst preschool teachers and investigate how a potential mobile app might affect the communication between preschool teachers and parents.

### 1.3 Research questions

- Which perceptions and expectations do parents have on a mobile phone application designed for communication between them and preschool teachers?

- Are there any technostress creators that influence the overall work production on preschool teachers?

### 1.4 Limitations

Technostress inhibitors are not relevant to this thesis. This study aims to investigate if technostress creators exist in kindergarten and not how to reduce technostress. Another aim of this study is to focus on the outcome, regarding parents’ insights on the overall technology in a Swedish kindergarten and
not children's education. This study will not investigate the technicalities in a communications app, such as hardware specification or mobile user interface (UI). Also, it should be noted that this study does not investigate which effects a communications app has on the preschool teachers because they do not use one, as of yet. Furthermore, the psychological and physical symptoms of technostress on affected individuals are not discussed in the thesis. Since this study does not intend to find out how technostress affects preschool teachers, but rather to explore if technostress occurs amongst preschool teachers at their work and how they deal with it.

1.5 Target audience

The primary target audience is preschool teachers, preschool directors and parents. The secondary target audiences is students and scientists who want to contribute to understanding technostress and its impact on people in the educational system.
2 Methodology

2.1 An inductive approach

To better understand the shaping of the methods for collecting and analysing data an academic basis was first built after reading related scientific studies. An inductive approach was later used for creating a hypothesis after analysing the collected data from interviews and the survey. The results presented discoveries that helped shape the research questions and the purpose of this thesis. Underlining specific data that is useful for a study contribute to link formal and substantive theories. An inductive approach is adequately used when the researcher intentions are to discover particular paradigms. (Bernard, H.R., 2006) The fundamental principle is that you start without a preconceived theory that needs to be confirmed. This implies to create a lightly unstructured way of methods for collecting the data, for example, semi-structured interviews or surveys. In order to collect data in a maximal transparent process, it is fundamental to be flexible throughout the whole period of data collection. (Creswell & Clark, 2011)

The purpose of this study is to investigate distinctive practices and paradigms related to a transparent and effective way of e-communication between preschool teacher and parents from the parents’ point of view. Additionally, this study aims to explore if technostress exists amongst preschool teachers.

2.2 Mixed methods

A mixed method research design is used in this thesis. Focusing on collecting and analysing the data from qualitative and quantitative methods. The benefit of using mixed method research may give further insights. (Creswell & Clark, 2011) Another valuable argument for using mixed methods is the increase of assets while reducing the limitations of the research, hence leading to bring out the best of both approaches. Adding a quantitative component in a qualitative method for data collecting could complement the overall results with new understandings of a phenomenon. (Dörnyei, 2017)

The design of a research project will determine which approach is most suitable and which methods are most adequate for collecting relevant data that can answer the research questions (Ahrne & Svensson, 2015). The primary aim of this study is to explore if technostress exists amongst preschool teachers and investigate how a potential mobile app may affect the communication between preschool teachers and parents. A survey was the most relevant method for gathering data to reach most parents. This method is quantitative, but the questions used in the survey have a qualitative design. The parents can convey their perceptions in a transparent manner. The ability to make a generalization of the results is greater in interviews with fewer respondents, and answers from larger groups of respondents give results much more depth. (Stukát, 2005)
2.3 Semi-structured interviews

The qualitative method was conducted with the help of semi-structured interviews with 6 preschool teachers. The motive to interview the app company that produces a communications app between preschool teachers and parents was to get a clear description of the functions in the app. The techniques of conducting an interview are numerous, including face-to-face, telephone call, online video software and focus groups. (Bernard, H.R., 2006) The choice to keep the interviews semi-structured was that it gave the possibility to explore topics in breadth and depth since the structure of the interview was not set. This created an opportunity for participants to lead the interviews and not be restricted by a specific set of questions. The aim of using semi-structured interviews was to be able to make sure I received answers to some specific questions, but also be able to let the participants reflect upon their answers and let them lead their reflections in the direction of their choosing. It was used as a way to help the answers not be too guided. (Ahne& Eriksson-Zetterquist, 2015) The fundamental aim of an interview is to obtain multifaceted knowledge by focusing on producing a particular narrative, which let the respondent reveal details about their thoughts and experiences of a subject (Brennen, 2012).

During some of the interviews conducted, there was a bit of silence between the interviewer and the interviewee. This was not a particular strategy used in the interviews, but more an accident. Gradually the periodic silence helped the respondents to add something on their answers without interruption. The most common method of probing during the interview was "tell-me-more probing". Meaning after the respondent gives an answer, the interviewer probes for more by remaining active in asking questions about the subject, for example, "what do you mean it is stressful for you?". (Bernard, H.R., 2006)

All the respondents received information ahead of the interviews concerning their rights to reject to answer or take part in the study. All the respondents were also given information about that the data collected and were treated with appropriate anonymity and confidentiality. They also approved being audio recorded during the interviews. (Appendix 1 - Interview questions with preschool teachers)

The following respondents were contacted during the study for semi-structured interviews.

<table>
<thead>
<tr>
<th>Participants</th>
<th>Age</th>
<th>Sex</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>56</td>
<td>Female</td>
<td>Preschool teacher</td>
</tr>
<tr>
<td>R2</td>
<td>52</td>
<td>Female</td>
<td>Preschool teacher</td>
</tr>
<tr>
<td>R3</td>
<td>24</td>
<td>Female</td>
<td>Preschool teacher</td>
</tr>
</tbody>
</table>
2.4 Development of the online survey

The Google forms online tool was used to create an online survey. This tool was selected because it is a free tool and easy to extract data from. The survey was conducted to understand the parent's point of view and to give the opportunity for the parents to provide their perceptions on the most valued features to create a transparent and effective way of digital communication. Surveying broadens the overall coverage at a specific point in time. In the search for impartial information in larger groups, surveys are used for the most efficient method of gathering mass data in a short period. (Denscombe, 2014)

The parents were informed with an introductory text before answering the questions about the two communication apps that are being tested at the kindergarten in order to provide context to the questions. It is of utmost importance that the questions in a survey are designed in such a technique that is logical and relatable to understand. (Patel & Davidson, 2003) The survey had mostly open questions, so the possibility to find correlations and patterns in the answers would be more transparent. It also gave the respondents a real opportunity for sharing what they regard as relevant. The last question in the survey asked them if they want to add anything that the questions before did not address. Another aspect of using an online survey was to make it as convenient and attractive as possible for the parents. There was no specific location needed or extraordinary equipment needed. The preschool director already had the parent’s e-mail addresses and could provide them for this study. So it was clear that all of the parents have regular and reliable access to essential equipment such as the Internet and a required device to take part in the survey. (Denscombe, 2014) (Appendix 2 – Questions for the survey)

The following participants conducted an online survey.

<table>
<thead>
<tr>
<th>Participants</th>
<th>Total</th>
<th>Age</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>14</td>
<td>25 - 41</td>
<td>Female/male</td>
</tr>
</tbody>
</table>
2.5 Coding of the data

An interpretive analysis is a process of understanding the collected data, rather than providing an universal truth. The data from the survey and interviews provides several personal insights, therefore the analysis is based on understanding and recognising the most mutual perceptions in association with the research questions. Quantitative data is regarded as the construction of numerical data, which means the results are not undue of influence for the researcher and be presented objectively. (Denscombe, 2014) Furthermore, categorising specific topics from a survey will provide a transparent structure in the results (Bernard, H.R., 2006).

The interviews were audio recorded and later transcribed. The qualitative research method inclines that the research questions cannot be specified precisely before collecting the data (Patel & Davidson 2003). Additionally, it is recognised that the researcher is the central "measurement device" for the data collection. The researcher’s background, values and beliefs have a significant impact on the outcome from the analysis of the data. (Denscombe, 2014) Consequently, personal experiences with the investigated kindergarten and its colleagues have in one way or another influenced the gathering and analysis of the data. Denscombe (2014) describe the qualitative researcher as a person who should seek evidence of cause-effect relationships in the data to discover the reasons for a specific behaviour or perception. Therefore, it was a main focus to reduce any preconceived beliefs and assumptions of the assumed findings in the data, by being conscious about it, through the entire study process.

2.6 Interview location

The setting of the interview can also have an impact on the results (Ahrne& Eriksson-Zetterquist, 2015). In this case, the respondents decided where they wanted to conduct the interviews in order to ensure they would feel comfortable sharing their thoughts. The preschool teachers wanted to conduct the interviews at their workplace, in the staff room. The staff room is located in another building and separated from the daily activities in the kindergarten. Having interviews at the workplace may have some affect on how they chose to express themselves (Ahrne& Eriksson-Zetterquist, 2015). These details were in consideration throughout the entire process of coding the data. The respondents were asked to give examples and describe situations that relate to research questions. So the discussion would have an additional inherent description of their experiences and thoughts. Moreover, for the parents, all they needed to have in order to take part in the survey was Internet connection and a device that contained a web browser.
2.6 Selection of respondents

Some of the difficulties while collecting data might occur with the selection of people to interview (Bernard, H.R., 2006). When conducting the interviews, there were occasions when the familiarity of the respondents result in usage of commonly used terminology at the workplace. However, in those cases, the respondents were asked to define their explanations so that a third-party would be able to understand the responses without prior knowledge of the work-related terminology. The aim is to let them evolve their answers by giving examples and describe situations that are connected with the research questions (Ahrne & Eriksson-Zetterquist, 2015). The initial invitation to ask preschool teachers to participate in the study was made at the kindergarten. The approval came from the preschool director who confirmed that was permitted to ask the preschool teachers.

A verbal approach was used to inform the parents about this study. To request that the parents take part in the survey the preschool director sent e-mails with an attached link of the survey to all the parents of the kindergarten. According to the new GDPR law, the person in charge of an organisation is the only one with that privilege (EU 2016:679). The e-mails had broad information about technology and kindergarten, and this was made to help the parents understand the questions. It also stated that taking part in the study was voluntary and confidential with the GDPR standards.

2.7 Ethical considerations

The Swedish research council (2017) guidelines on ethical considerations were used throughout the whole period of data collection. The Information Obligation infers that the researcher has to inform the respondents of the purpose of the study. The Consent Obligation requires consent from the respondents taking part in the research. The Confidentiality Obligation means that the researcher has to protect and handle any personal information from the respondents as promised. The Use Obligation means that the collected data from the participants are not used for commercial- or other non-scientific purposes. (The Swedish research council, 2017)

There were 20 participants taking part in this study and they were informed about the research in order for them to decide whether they wanted to participate or not. Before the interviews took place the respondents got an informational letter about the study, anonymity and confidentiality. They all signed and approved being a part of the study. It is recommended to have a written informational letter with consent. The goal is to be transparent in the role of a researcher and let the participants understand their rights. (Gillham 2008)

For the survey, the parents received an e-mail before taking part in the study with information about the research project and their rights. They also got a chance to read more about the study and the necessary information regarding their rights. Two notices were hung up at the entrance door of the
kindergarten, frequently used by the parents, to inform parents about the study. The parents could not be identified using the survey. They only had to put in personal information such as gender and age. When the thesis is published, it would not be possible to uncover the participant’s identities.

2.8 Validity and reliability

Some of the reasons for a low response rate include literacy, memory and vulnerability (Denscombe, 2014). There was an approximately 31% response rate of the surveys. However, most of the respondents had an answer completion of 100%. Only 1 parent out of 14 did not answer two questions. Denscombe (2014) claims that surveys have little value if they are not completed and delivered to the researcher. Therefore, the responses in the survey affected the validity and reliability of the results. If people are not able to answer or find it hard to understand a question, the wording of the questions may have been inadequate. (Stukát, 2005) If all parents had been informed personally or attended a meeting about the study, the answer rate might have had been higher. On the other hand, arranging a meeting that would fit every parent's availability regarding time and date, would have been too difficult. Some of them might not have been interested in taking part in the study or had limited time for attending. Informing all of the parents individually face-to-face would also be problematic and require too much time. Furthermore, there is not a guarantee that the informed parent would share the information with his or her partner. According to Ahrne & Eriksson-Zetterquist (2015), open-ended questions in a survey could be demotivating for the respondents, because the respondents may not relate to the topic of the study or a question. The survey included mostly open-ended questions. The two blank responses were to open-ended questions. A reason for that could be that the respondent did not relate to the questions even if they were informed about the research purpose. However, they were also informed that it is voluntary to answer or not answer any questions they choose.

The generalization of a study is associated with its validity and reliability. The results from research may be generalised, used for understanding comparable previously studies or it is solitary related to the investigated phenomena. (Stukát, 2005) In this study, some factors may have affected the generalization. For instance, the investigation of the kindergarten at a specific occasion, while they are testing two mobile apps for communication between preschool teachers and parents, may be difficult to find and not relevant to compare with other studies. Furthermore, the personal relationships between the preschool teachers and I at the kindergarten, as well the parents possibly might have influenced the outcome of the study. Nonetheless, the working experience I have from the kindergarten may have contributed to getting more data out of the respondents because of our familiar associations in the kindergarten.
3 Literature review

It is essential to recognise the concepts about stress and technology at the workplace in order to analyse the results. The related work and studies in this section aim to contribute with scientific theories about preschool teachers, technostress and mobile apps for communication between preschool teachers and parents.

3.1 Challenges of being a preschool teacher

The relationship between education and changes in society has affected the parental and community's expectations of preschool teachers. The new expectations result in modifications of the curriculum and teaching practices. Many preschool teachers state that they are unable to implement the new curriculum. The government’s economic imperatives also have an impact on teacher's work and organisation. If there is a recession, there will be fewer resources on education and a higher risk for potential unemployment among teachers. (Kelly & Berthelsen, 1995)

Severe stress during a more extended period might lead to fatigue, depression and hypertension. The recovery time after work affects the stress-related symptoms. The home has traditionally been a place for recovery after work, but the increase of demand and duties at work might have a negative impact on family life. (Sjödin & Neely, 2017) The work and family domain is to some extent incompatible with each other, which means having a bad day at work will affect your private life (Greenhaus & Beutell, 1985). Among other factors of severe stress in teaching activities are excessive paperwork, the number of children in the units, and communication with parents and colleagues (Clipa & Boghean, 2014).

3.2 Preschool teachers' perceptions of technology

According to the Swedish school inspectorate, many kindergartens do not offer any technical education at the workplace and the employees have expressed an uncomfortable experience with using technology. It is mainly women that work within kindergartens in Sweden. Furthermore, working in human resources or education may be associated with the symbolism of feminine identity, while interest in technology is more associated with ICT linked jobs such as IT, business and sales etc. and may attract more men. These fields and subjects are strongly gender-coded and attract people whose gender matches with the coding. As an example caring for children is coded as feminine, while technical work jobs are coded as masculine. (Hedlin & Gunnarsson, 2014)

Digitalisation of the educational system may be stressful for teachers. It may create a demand to learn new ICT, which requires extra effort and may lead to a higher workload and time pressure. It might
also mean a change of preschool teachers’ methods of teaching, creating a compulsive increment of educational use of ICT. This could be counter-productive if the teachers experience a level of Technostress. (Syvänen et al., 2016)

3.3 Technostress

In today’s society where information technology is incessantly changing and evolving, people tend to feel more stressed and experience negative implications of ICT such as anxiety, dissatisfaction and a feeling of being overworked (Tarafdar, Bolman Pullins, & Ragu-Nathan, 2014).

In a study of Ahmad and Amin (2002) on librarians and technostress, they found that the participant's experience of technostress was at a medium level because the participants used an intensive amount of ICT regularly at work. The conclusion was that using intensive ICT daily could be seen as a reason for technostress. A study conducted by Salanova, Llorens and Cifre (2013) implies that a difference between the intensive users of technology and the occasional ones exists. Another study mentions that the principal reasons for technostress are seen as workload. Time problems, technical support, social support and the need for basic training courses on the use of ICT were all categorised as factors for technostress. (Çoklar et al., 2016) Furthermore, extreme levels of technostress could be related to lower job satisfaction and job performance. It may also lead to less engaging teachers who would lead to poorer learning for the children. Most of the studies about technostress are primarily focusing on knowledge workers, for example, engineers, programmers, lawyers and white-collar workers. (Tarafdar, Bolman Pullins, & Ragu-Nathan, 2014)

3.3.1 Demographics in Technostress

Ong and Lai (2006) argue that females experience more level of technostress than males. This assumption is based on findings that are indicate women tend to have higher anxiety with technology than men. However, there are findings in other studies that oppose such assumption by implying that gender does not affect anxiety. Instead, those findings might be related to work autonomy and not demographics. (Shah, Hassan, &Embi, 2012)

Factors such as formal education and technical experience of ICT influence the consequence of technostress. The usual assumption is that older employees experience a higher level of technostress than their younger co-worker. The reason is because it is expected that the younger employees are more acquainted with modern technology. (Syvänen et al., 2016) One empirical discovery found that older employees have more work-related experience and can control the level of technostress. One explanation is that older employees might be better at coping with other work-related stress because they faced similar situations multiple times and learned how to handle them. (Tarafdar et al., 2011)
3.3.2 Technostress creators

The inability to cope with technostress is the result of the insufficient-adaption ability of ICT. The phenomenon that creates this adaption problem is called technostress creators. (Ragu-Nathan et al., 2008) Tarafdar et al. (2011) found seven factors causing technostress in the workplace.

The exacerbate role overload: Employees may perceive their work to be difficult when they experience an overload of role-related tasks. Techno-overload compels the employees to process more information in less time. They can be contacted through phone calls and e-mails at any time and feel forced to respond at any given take during the day. (Tarafdar et al., 2011) They are exposed to more ICT than they can effectively handle and use. Laptops, smartphones and applications have created an environment of dealing with streams of information from external and internal sources, and the employees have to simultaneously deal with these devices at work. (Tarafdar, Bolman Pullins, & Ragu-Nathan, 2014)

They are associated with increased role conflict: Facing contradicting requirements at work, and for example, working overtime may generate a level of technostress. Furthermore, constant changes in new ICT may create contradictions in new and existing workflows. Employees may develop a lack of trust about the "new application" that is put in the system. Moreover, this creates insecurity and simultaneously affects the technical skills required to use new ICT. (Tarafdar et al., 2011)

Technostress is linked to reducing job satisfaction: Employees that experience technostress at some level, are at risk of having a negative view of their job. Therefore having a low degree of job satisfaction. (Tarafdar et al., 2011)

Employees experiencing technostress face decreased innovation in their work: Using new ICT may lead to a techno-overload, hence limiting both time and innovation possibility for finding ways to accomplish active using of ICT. Additionally, having an unwillingness and inability to learn about the new system could affect overall work satisfaction. (Tarafdar et al., 2011)

Employees experience a reduction of productivity in their work: The constant difficulty with techno-complexity forces the employees in dealing with ever-changing applications, hence increase the possibility to make mistakes and waste time. The lack of technical support within the workplace might lead the employee to process unnecessary information and lose track of relevant work tasks, leading to a less productive way of working. (Tarafdar et al., 2011)

Employees experiencing technostress are dissatisfied with the usage of ICT: All of the above themes create difficulty in identifying useful information, employees are intimidated and in general time-consuming. This creates scepticism and dissatisfaction with using the systems and application put in place. It can take months before a new application is studied and used effectively. The employee
may find the new functions in a system or application challenging to learn, leading to having a negative attitude towards new ICT. (Tarafdar et al., 2011)

**Technostress is associated with low commitment in current organisational goals and values:** Job dissatisfaction and lack of organisational commitment harm the employees and might be a considerable cost for the organisation if they do not address the issues. (Tarafdar et al., 2011)

### 3.4 E-communication between parents and teachers

The parent's engagement is essential for interventions involving support for their children's development in school. The early school years of a child with encouraging and supportive parents set a good structure for educational improvement. Using text-messages or other communication systems to inform parents about their child's educational progress may have positive effects. With unique and personalised information in a text message, parents feel they have more knowledge about their child's day at kindergarten, therefore a clear information path is produced. If the child did not remember what they ate for lunch or did during the day, parents can check their mobile phones to be updated. Another use of how teachers could communicate with parents is to emphasise on what the children need to improve rather than what they excel at. Technology has the potential to send personalised or general messages. Schools have an important role in how families get the most transparent and useful information. (Smythe – Leistico& Page, 2018)

In a study by Can (2016) investigating parents' opinions on using a mobile application for communicating with the teachers found that the majority of parents expressed a positive attitude on using a mobile app to communicate with the teacher. The findings were consistent with previous research that found parents attitude toward using mobile communication app as useful. Collaboration between parents and teachers is essential for the student's future achievements in school. To help parents be more included in the school activities, a good info- system should be established — some suggestions for school authorities that want to implement a mobile application as a parent-teacher communication system are informing and training the teachers before using the new app. This allows the teachers to understand the usefulness and benefits of the new technical device. Providing encouragement from school authorities may attract the teachers to the use of the new system, and also increase their intention of using it. (Ho, Hung & Chen, 2012)

A child's academic progress may be influenced by a transparent and constructive communication between parents and teachers. Modern technology has the ability to build positive relationships between teachers and parents. This is central for working with one another for creating the best possible learning environment for children. Using e-communication allows quick and convenient exchange of information between parents and teachers. Many schools use e-mails, phone calls,
newsletters and memos to inform parents about school programs and students progress. Teacher’s commitment decides the time they spent on communication with parents. Excluding some of the systematic ways of communication such as writing weekly e-mails to parents might enhance the commitment of teachers. Short message service (SMS) is a technology that provides a faster transfer of information from one user to another. Short messages are a valuable tool to enhance communication between parents and teachers. (Tanaka, 2002)

3.5 Summary of literature review

Changes in the educational curriculum may cause difficulties for preschool teachers. New teaching practices for preschool teachers might be challenging to implement. (Kelly & Berthelsen, 1995) Some factors of stress amongst preschool teachers may be excessive paperwork and communication with parents and colleagues (Clipa & Boghean, 2014). The digitalisation of the educational system may be stressful for teachers. It may create a demand to learn new ICT, which requires extra effort and may lead to a higher workload and time pressure. (Syvänen et al., 2016) The fact that preschool teachers might experience stress by changes in educational curriculum and learning to use new ICT helped shape some of the questions in the online survey and the interviews. It also contributed to interpreting patterns from the collected data to discover if the preschool teachers and parents have concerned regarding technology in kindergarten.

Older employees experience a higher level of technostress than their younger co-workers. The main reason being younger co-workers are more acquainted with modern technology. (Syvänen et al., 2016) On the other hand, another study argues that the older employees might be better at coping with other work-related stress because they faced similar situations multiple times and learned how to handle them (Tarafdar et al., 2011). ICT is constantly changing and evolving. People tend to feel more stressed and experience negative implications such as anxiety, dissatisfaction and feeling of being overworked. (Tarafdar, Bolman Pullins, & Ragu-Nathan, 2014) Being doubtful or insecure about new ICT used in the workplace may create a higher level of technostress amongst people. The lack of technical support within the workplace might lead the employee to process unnecessary information and lose track of relevant work tasks, leading to a less productive way of working. (Tarafdar et al., 2011) The kindergarten has two preschool teachers that are 50 years or more, they have worked at the kindergarten the longest. The other preschool teachers are between 24 – 34 years old. In the analysis of the results the theoretical framework of older employees might experience a higher level of technostress as opposed to younger employees found compelling data regarding the second research question.
Encouraging and supportive parents have a vital influence on a child’s educational development. Different communication systems that inform parents about their child’s educational progress may have positive effects. Technology offers possibilities for personal feedback between preschool teachers and parents (Smythe – Leistico& Page, 2018). When introducing a mobile app for communication between parents and teachers, an introductory meeting that includes information and explanation about the functions and usage of the mobile app is recommended. Existing technical insecurities may be reduced when teachers feel encouraged by school authorities. (Ho, Hung & Chen, 2012) Modern technology allows quick and convenient exchange of information between parents and teachers. Short messages are a helpful tool to enhance communication between parents and teachers. (Tanaka, 2002) The last section of the literature summary confirms many perceptions parents have about e-communication. The literature review helped creating the questions in the online survey and the interviews and was later used as the theoretical framework in the analysis of the results.
4 Results

In the following section, the outcome of the research is presented. The first section includes interviews with the preschool teachers. The respondents of the interviews with the preschool teachers have been given numbers ranging from 1-6. An abbreviation of the word “respondent” will be used, for example, respondent 1 = R1. The last section contains the results from the online survey. There were 14 replies out of 44, which gave an answer rate of 31%.

4.1 Interviews with preschool teachers

The kindergarten has three departments based on the age of the children. There are 11 children ages 4 – 6 years, 10 children ages 3 – 4 years, and 7 children ages of 1-2 years. The kindergarten has four substitute teachers who only work when one or more of the full-time preschool teacher is not able to work. The preschool teachers work in pairs. The 6th preschool teacher is considered an extra resource and works in different departments depending on the needs. All of the preschool teachers are female and have different schedules, some work full-time and other work part-time. That means that some preschool teachers close the kindergarten at the end of the day and others finish their work shifts around noon during certain days of the week. R1 and R2 are older than 45 years of age. R3, R4, R5 and R6 are younger than 35 years of age.

4.1.1 Implementing a mobile app at kindergarten

The staff at the kindergarten organised a parent meeting to inform them of the plans of getting a mobile communication app. The preschool director informed the colleagues about these plans two weeks before this meeting. At the meeting, only a few parents expressed concerns about getting a digital app. They feared that the preschool teachers would spend less time with the children. Subsequently, it could lead to presenting how things seem to be rather than follow the learning goals in the new curriculum. According to the respondents, they felt that the overall feedback was positive. Two parents that work as preschool teachers already use similar communication apps. They both highly recommended using one. The preschool director has informed all parents about the essential functions in the app. One of the features is that the parents have a direct channel to the preschool teachers and vice versa, their children have an individual portfolio for pictures, information etc.

4.1.2 Communication between preschool teachers and parents

All of the respondents mention that the primary use of today’s communication is by face-to-face with the parents. R1 and R2 mention in some cases that other colleagues may not be as well informed about the activities R1’s and R2’s department have been doing during the day. So when parents ask about
their children’s behaviour and activities, the colleagues might have difficulties giving a correct and authentic description. If a child gets hurt or ate poorly during lunch, they would inform the colleagues and write down the main points of the situation on a piece of paper. This paper also works as a petition to track which children are present at the kindergarten during the day. R1 discusses their concern regarding using this paper and that it is continually moving around the departments and that there is the possibility for unauthorised people (parents, janitors, other people) to read it. R1 and R2 mention that depending on which parent picks up the child, this may have an impact on how the information from the preschool teachers is received. R1 sense that some parents forget or just do not share information with the other partner and the next day an annoyed parent approaches them. R1 believe they could have more personal and direct communication with parents by using the app.

4.1.3 Reasons of using a mobile app for communication

The respondent's perceptions of the app they are getting are based on that it should be the primary communications tool between the parents and among colleagues. Another reason for getting the app is for the documentation. All of the respondents mention these reasons as being the main reasons for implanting an app in their work procedures. R5, R2, R6 and R3 comment that it is better to have everything together digitally in one place and not to have to search many physical papers. All the respondents are aware of the new requirements from the curriculum of using more documentation in the kindergarten. R1, R3 and R5 point out that with the app they could show the parents the children’s development according to the learning goals in the new curriculum. All respondents believe the daily communication will be improved with the parents because the app will work as the principal device for digital communication. However, R1, R2 and R4 predict that face-to-face communication will still be highly appreciated from parents. So they would focus on having good face-to-face communication.

4.1.4 Current technology and its connection to technostress

The most common reason for stress-related emotions is lack of time and unpredictable events. All respondents have expressed frustration with troublesome ICT. The kindergarten uses ICT daily such as computers, smartphones, printers and tablets. They all are aware of the new additional paragraph in the Swedish curriculum about digitalisation. Some have read it, others have heard about it from the colleagues. However, they have not had a meeting with all the colleagues and the preschool director to discuss how it would change their working procedures yet.

R2 and R3 express their views about the daily technology with mostly scepticism. Both of them have worked at the kindergarten the longest, over 15 years and are the oldest employees. R2 is critical about the new changes in the Swedish curriculum regarding technology. R3 revealed a lack of confidence regarding technology and explained that there is already enough of ICT used in the kindergarten. R2,
R6 and R3 propose that the preschool teacher education should include more technical courses. The fresh graduates would have more technical knowledge adapted for the Swedish curriculum and hence be there as support and a mentor for the other colleagues. Otherwise, they predicted that in the future kindergartens, they might have to hire a new set of labour or a person whose responsibility lies in the technical field. All respondents discuss how expensive that could be for private kindergartens and possibly change the way we reflect on parenting.

All of the respondents mentioned a concern for technical issues like having a stable and constant internet-connection as a possible weakness in their daily ICT. They all have experienced situations where the internet-connection is unreliable and that affect their work. R6 describes an event that took place last semester. When R6 was at work and had to finish uploading documents and pictures on the computer ahead of a parent’s meeting, the Internet connection was lost. R6 had to finish the work at home, outside of working hours and it was not the first time. All of the respondents did describe that they had to work at home in one-way or another. In other cases, the printer was too slow or they did not have any ink, or the computer needed an update and that creates even more time loss. R2 and R1 say they are aware that the lack of confidence with their technical abilities may affect their view with other ICT. Both of them bring up examples that regularly happen every month. R1 describes a melancholic approach when doing documentation or interacting with other ICT at work. Usually, R1 lets other colleagues help out or hand over the responsibility to someone else. That makes R1 sometimes feel like a poor colleague and this outcome affected their self-esteem. The respondents R4 and R5 did not give the same transparent explanation but expressed having issues with ICT at some point in their careers.

4.2 Survey results

There were ten women and five men that took part in the survey. They are either a mother or a father of a child or children that attend in the investigated kindergarten. The ages of the parents are between 29 and 58. Most of the parents answered every question, and some did not. (See Appendix 3 for all questions used in the survey)

The results reveal that majority of the respondents feel positively towards implementing and using a communications app for the kindergarten, but there are concerns that the new app would affect the preschool teachers working procedure. Some of the concerns were lack of time for preschool teachers to be with the children and increased stress.
4.2.1  Parents and their current technical experience

The parents have never used a mobile app for communication between preschool teachers and them before. But they have used different form of technology for communicating with preschool teachers such as e-mails, SMS, phone calls etc. The parents say they use e-mails to read information from the kindergarten and when they have questions or a personal matter. However, they mostly use a mobile phone for calling or texting when needed. All parents agree that every ICT the kindergarten uses for communicating with them works fine. There were no suggestions for improvement or if something did not work smoothly. All respondents declared as having a decent technical ability for downloading and using an app.

4.2.2  Functions desired by parents

The parents were informed at a meeting with the preschool director about the communications apps, hence presumably have some knowledge of the app's functions. Five out of 12 respondents that answered mentioned that they would appreciate if there would be a portfolio for every child. So they could follow their child’s progress and see what they do. The five parents would like to see what their child is doing, get photos or video clips from the kindergarten. One parent suggested capturing when the children are singing or drawing something. Three parents mentioned that a communications app should be user-friendly. They did not explain how it should be user-friendly. Another parent wants to have information about how much the child ate, how long they slept and if it was happy or sad during the day — the parents discuss that sometimes the preschool teachers may forget to say something when the parents pick their child up. There were only two parents who talk about security when using the app. Moreover, only one parent stated that they do not need a communications app, but would understand if the kindergarten uses one in the future because of the new changes in the Swedish curriculum for the educational system.

4.2.3  Parents main concerns with a mobile app

Two out of 14 parents said they could not see any problems with using a communications app in the kindergarten. The majority (9 out of 14) revealed that one concern they have with using the app is about the preschool teachers. Some say they are worried it would create more stress for the preschool teachers because they have more responsibility to document the children's progress. Another remark was that the work procedures of the preschool teachers may change for the worse, that they would focus too much on using the app and spend less actual time with the children. Five out of 14 discussed the fairness of letting personal information be available for unauthorised people or that the information in the app would get hacked. One parent mentions that using the app too much could make the daily face-to-face communication impersonal. Another parent said that it is more important that preschool
teachers are present and play with the children than document everything the children do. To being always available for a direct communication seems farfetched. Another parent was distressed that other parents may demand more information and documentation in the app daily, which would lead the preschool teachers to lose track of being present with the children. One parent is concerned that the app could enhance the level of stress among the preschool teachers because abundance of documentation is required.
5 Discussion

The main findings from the study indicate that preschool teachers experience frustration and some level of stress when using specific ICT at random times. However, there are similar insufficient studies with comparable case-study design to determine if a communications app would decrease the level of stress and increase the transparency and efficiency for communication between preschool teachers and parents. On the other hand, most parents and preschool teachers express positive attitudes regarding a change to more digital communication with the help of a communications app. The conclusions are based on the sample of this study. The research questions are analysed and answered.

5.1 Current challenges for the preschool teachers

The relationship between education and changes in society has affected the parental and community's expectations of preschool teachers. The new expectations result in modifications of the curriculum and teaching practices. Many preschool teachers state that they are unable to implement the new curriculum. (Kelly & Berthelsen, 1995) R2 is critical about the new changes in the Swedish curriculum regarding technology. R2 and R6propose that the preschool teacher education should include more technical courses. R3 predicts that with the new changes in the Swedish curriculum regarding technology, the role of a preschool teacher will change in the future and it will be more difficult to implement the new curriculum in their work. This indicates that technical knowledge should be apart of the preschool teaching education.

According to Sjödin& Neely (2017) preschool teachers may be stressed due to lack of required time for pedagogical documentation and other working tasks. This often leads to working overtime and an increased workload. All respondents stated that they experienced stress at work, home and when working over-time, at some period of their career. Among other factors of severe stress in teaching activities are excessive paperwork, the number of children in the units, and communication with parents and colleagues (Clipa&Boghean, 2014). R1 and R2 mention that depending on which parent picks up the child, this may have an impact on how the information from the preschool teachers is received. R1 sense that some parents forget or just do not share information with the other partner and the next day an annoyed parent approaches them.

5.2 Technostress among preschool teachers

Tarafdar et al. (2011) argue that technostress is associated with low job satisfaction. Tarafdar, Bolman Pullins, & Ragu-Nathan (2014). argue that an advanced stage of technostress during a period may affect the working- and private life. The symptoms could be depression, irritability and behavioural
changes. R5 expressed feeling depressed during the sick leave, which is indicative of experiencing low job satisfaction. On the other hand, it is uncertain how big the impact of technostress had on R5.

R2, R4 and R6 expressed a feeling of frustration with using ICT. R6 felt stressed when dealing with unreliable ICT and lack of time for planning or documentation. All the respondents expressed having specific issues with ICT, such as terrible Internet connection and slow computers. According to Salanova, Llorens and Cifre (2013) there exists a difference between the intensive user of technology and the occasional one. From analysing the results, it is uncertain to determine how frequently each respondent’s use of ICT during the day and which affect it has on the overall working procedures. On the other hand, R2 and R3 expressed scepticism towards daily use of ICT and the addition of the Swedish curriculum regarding technology. R2’s explanation is that they have always used specific methods for documentation and communication for several years, and that significant change may be ineffective. They have been working the longest in the kindergarten and are the oldest of all colleagues. Tarafdar et al (2011) state that constant changes in new ICT may create contradictions in new and existing workflows. Employees may get a suspicious opinion about the "new application" that is put in the system. This indicates that R2 and R3 have suspicious minds about the new technology requirements demanded by the curriculum for kindergarten and elementary school education.

R2 and R3 revealed a lack of confidence regarding the use of technology and mentioned it is already enough of ICT used in kindergarten at the moment. According to Tarafdar et al (2011) older employees have more work-related experience and can control the level of technostress. One possible explanation is that older employees cope better with stress-related situations. The findings in this study contradict that assumption when the two oldest employees express a lack of confidence using technology. Another explanation could be that R2 and R3 are experiencing stress from non-related ICT situations, or because they have used specific methods for documentation and communication for an extended period and are anxious about sudden changes. On the other hand Syvänen et al. (2016) claims that the level of frustration and stress with ICT decreases when the technical ability is increasing. That indicates that R2 and R3’s lack of confidence for technology is possibly based on their technical abilities. Furthermore, according to the Swedish school inspectorate, many kindergartens lack conducting a technical education at the workplace. The employees express an uncomfortable assessment with using technology (Hedlin & Gunnarsson, 2014). That indicates that the preschool director should let the staff take part in different courses regarding technology and preferably arranging workshops for the communications app. A solution could be inviting the tech-company that produces communications app to have a demonstration about the apps. This suggestion is grounded on the fact that R2, R6 and R3 wish to attend technical courses.

Sometimes R1 lets other colleagues help out or hands over the responsibility to someone else when ICT is needed. That affects R1’s self-esteem negatively. Confidence in using technology may let other
colleagues share valuable information and knowledge to help in technical related tasks. That may help the colleague to reduce technostress, by testing and understanding the new technology. (Ragu-Nathan et al., 2008) This indicates that the preschool teachers at the kindergarten should all have a basic set of technical skills for the requested requirements. Therefore, suggesting letting the colleagues that have more confidence and knowledge in technology be supportive and helpful when needed.

The preschool director has not yet had a meeting with the staff considering the new changes in the Swedish curriculum and how it will affect the working procedures. Describing the purpose and informing of a new application might encourage employees to be positive about using the system, as well give employees an opportunity to contribute with inputs which will make them less uncertain of using a new application (Tarafdar et al., 2011). This indicates that the kindergarten should set time and focus on how everybody at the kindergarten can contribute to these new changes. On the other hand, having meetings to inform about new changes without letting the employees have a chance for constructive discussion may subconsciously affect their working morale and their perceptions of getting a new ICT in the shape of an app.

5.3  Parents perceptions and expectations of the mobile app

The results reveal that the majority of the parents are positive towards implementing and using a communications app for the kindergarten.

The parent's engagement is essential for interventions involving support for its children's development in school. The early school years of a child with encouraging and supportive parents set a good structure for educational improvement. Technology has the potential to send personalised or general messages. Schools have an important role in how families get the most transparent and sufficient information (Smythe – Leistico& Page, 2018). Majority (9 out of 14) parents have concerns about using a communications app. Some say they are worried it would create more stress for the preschool teachers because they have more responsibility to document the children's progress. That indicates possibly including the parents participate in the process of finding a suitable app, to ensure them that their concerns are appreciated as much as the preschool teachers. Hence, leading to a transparent dialogue throughout the whole process of finding a suitable app, which could direct towards more effective digital communication.

The majority of the parents expressed that a mobile app for communication would make it easier to follow their child’s progress in kindergarten. Five out of 12 respondents that answered mentioned that they would appreciate if there were a portfolio for every child. That way they could follow their child’s progress and see what they do during the day. Tanaka (2002) found that modern technology
has the ability to build positive relationships between teachers and parents. Using e – communication allows a quick and convenient exchange of information between parents and teachers. In a study by Can (2016) investigating parents’ opinions on using a mobile application for communicating with the teachers found that the majority of parents expressed a positive attitude on using a mobile app to communicate with the teacher. Good information systems should be established — some suggestions for school authorities that want to implement a mobile application as a parent-teacher communication system are informing and training the teachers before using the new app (Ho, Hung & Chen, 2012). Regarding these studies, the kindergarten should find an app, that has proper functions regarding the desires from the parents as well connected to the new changes in the Swedish curriculum, so the preschool teachers work procedure will be more effective and the communication with parents more transparent.
6 Conclusion

One of the aims with this study was to investigate which insights parents consider as most valuable for creating a transparent and effective way of digital communication using a mobile app. The parents express positive perceptions towards getting and using a communications app for more transparent and effective communication. The theory presented in the study demonstrates which guidelines a kindergarten should acknowledge for making the transition to digital communication as simple as possible, without excluding the parents. Letting the parents participate in the process of finding a mobile app could optimize the communication for preschool teachers and parents. This study indicates that the parents’ requirements of specific functions in a mobile app for communication should be considered by kindergartens.

The other aim was to establish if technostress occurs amongst the preschool teachers. By analysing of the outcome data, this study reveals that preschool teachers feel stressed at work for different reasons. Technology has a direct effect on the preschool teachers experience with frustration and stress on certain occasions. While the study did not confirm which technology is connected to technostress or if all preschool teachers ever truly experience it before, it still found that majority of the preschool teachers have constant issues with unreliable technology. Meanwhile, parents express positive perceptions towards getting and using a communications app for more transparent and effective communication.

The main finding of this study is that preschool teachers and parents should be more involved in the whole process of finding a suitable mobile app, so they would be motivated to contribute for a better daily communication. This study suggests that the most important strategies for implementing a mobile app for communication are to inform, educate and involve all the concerned parties. Implementing those strategists could reduce the level of technostress amongst preschool teachers and could help to fulfil the parents’ expectations of e – communication.

6.1 Future work

For future studies, a recurrent investigation of the kindergarten could enhance the validation and expand the data from the results, after the preschool teachers and parents have used a mobile app for communication for some time. Also, making a comparison with other kindergartens that use mobile apps in the work procedures could find new and exciting data.
References


EU. General Data Protection Regulation, 2016:679


Appendix 1- Questions for interviews with preschool teachers

- What is your name and job role in the kindergarten?
- How did you end up here today, how long have you worked in the kindergartens? world
- How do you describe the communication with the children's parents at the preschool and your way of documenting?
- Which methods do you use to communicate with parents, e-mail, phone calls, social media?
- What is your perception of getting an app that will help you with documentation of the children and communication with the parents?
- How much were you involved in choosing a communication app? How did the process go?
- What do you think are the biggest challenges to getting such an app?
- How is communication with parents who do not have Swedish as their mother tongue or have difficulty expressing themselves?
- How will you mainly use the app, what opportunities does it open up?
- What do you think about the Swedish preschool's curriculum and that digital development for children gets more space and obligation than before?
- If there is anything you would like to change in the app or add, please tell. Which functions would make it easier for you preschool teachers?
Appendix 2 – Questions for online survey

- Gender - Male or female
- Age – free text
- How often do you ask your children about their day? If you talk with them, how often do they remember and what do you talk about? – free text
- Have you used a communications app for communicating with the kindergarten, like Tyra or PrestoDaycare before? - free text
- Have you used technology (social media, e-mail, mobile phone, text-message, blogs or other apps) to communicate with the staff at the kindergarten? – Yes or no
- If yes, which ones? And how well does it work – free text
- Which functions would you appreciate in a communications app like PrestoDaycare (ex. Good communications ability, digital security, translation in different languages, portfolio for the children) with other words, which requirements do you have? – free text
- What do you think are of the most importance when the preschool teachers use an app like the one they plan to buy? To document everything the children do or to have daily contact with you? – free text
- What is your biggest concern as a parent regarding the fact that the kindergarten will buy an app for the general communication and documentation? – free text
- How would you describe your technical ability? Is it easy to download an app and directly understand it? Or do you need someone to help you?
- If you worked at the kindergarten, how often would you use an app like PrestoDaycare? – Never, 1-3 times per week or daily
- You can add anything here regarding technology and kindergarten, if you feel I missed it in the previous questions – free text
Appendix 3 – Letter of consent

Information letter and request for participation in an interview study

The study concerns current technology in kindergarten and stress amongst preschool teachers. There is mobile apps that facilitate the communication between parents and preschool teachers. The mobile apps also help preschool teachers with the documentation of the children. I recommend going to Tyra's and PrestoDaycare's website for more information on what their mobile apps are doing.

The entire interview will be recorded using a sound recorder. The interviews will be treated confidentially, which means that the interviews will be identified and treated in accordance with the provisions of the Secrecy Act. You have the right not to answer all questions and can cancel participation at any time. If you have any questions about any questions or would like to clarify your answer, please email me at vasil_89@hotmail.com and we can arrange an additional interview opportunity.

Written, informed consent to participation in the interview study

I have been informed about the purpose of the study, about how the information is collected and processed. I have also been informed that my participation is voluntary. I can cancel my participation in the study without stating cause when I want. I hereby agree to participate in this study concerning with preschool and technology.

________________________________________
City/ Date/ Year

________________________________________
Signature

________________________________________
Printed name