



Swedish preschool teachers' experiences from pedagogical use of digital play

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ABSTRACT: This article reports on findings from an interview study with eleven Swedish preschool teachers. The purpose was to increase the knowledge about preschool teachers' experiences from pedagogical use of digital play. The participants were preschool teachers who used digital play in their practice, and their narratives were analysed using an inductive approach to thematic analysis (Braun & Clarke, 2006). The results showed that the use of digital play provided more opportunities in children's creative work, better pedagogical documentation, access to the Internet as a source of information, access to more pedagogical material and opportunities to create new pedagogical activities. Two main teaching objectives were identified in the participants' statements, to prepare children for school and for life in a digitised society. The participants wanted to increase children's access to tablets and increase children's agency in their digital play activities. Furthermore, they wanted to increase their pedagogical knowledge about digital play and they wanted to be in control over the digital play activities that they introduced in their practice.

Keywords: preschool, digitalisation, workplace practice, tablets, digital play

Background

Digital play

The pedagogical use of digital technologies used to be a peripheral part of Swedish preschools (Ljung-Djårf, 2004). The introduction of tablets increased some preschool teachers' interest because tablets made it easier to identify the educational potential of

digital technologies (Marklund, 2019). Mertala (2017) states that it is important to study where preschool teachers' positive attitudes towards information technology (IT) come from, especially considering that many preschool teachers have had limited training about IT and have limited experiences of using IT in their practice. The present study is focused on Swedish preschool teachers' experiences from the pedagogical use of digital play. Defining digital play as a concept is no easier task than to define the concept of play, which according to Zosh et al. (2018) has plagued researchers and philosophers for years. They declare that the criterial features of play are hard to pin down and consequently suggest that play should be conceptualised as a spectrum, from free play through guided play to games and then playful direct instruction. Moreover, they claim that a single-minded focus on children's free play has prevented researchers from studying a wider range of experiences which are constructed by adults but that are playful in essence. In the curriculum for the Swedish preschool, it is stated that play should be the foundation of children's development, learning and well-being (Lpfö, 2018), which suggest that play and learning are concepts that are mutually intertwined. Plowman and McPake (2013) make a similar connection between play and learning in the argument that children's experiences, when playing and learning with technologies, can contribute to children's learning.

Danby (2013) provides a list of activities that can generate learning in the claim that technology integration enables activities that can be played, created, watched, listened to and read, and can be incorporated into traditional everyday practices. Plowman and McPake (2013) state that most early years specialists agree that the best educational experiences for pre-schoolers are based on play, even though the relationship in terms of specific learning outcomes of play is difficult to establish. Zosh et al. (2018) took on this challenge and established relationships between the different forms of play included in their aforementioned spectrum of play, and their respective potential to support children's learning. They found that guided play, where adults help to structure the activity and where the activity is focused on a learning goal had the best potential to support children's learning. Moreover, they emphasised that the child should retain an agency to direct the activity in guided play. In consideration of how the curriculum presents play and learning (Lpfö, 2018), the participants of the present study were informed that: the concept of digital play concerns activities where children use digital technologies for pedagogical purposes in preschool, and such activities can range from children's free play with digital technologies to activities where teachers are involved to initiate and guide the activity towards specific learning goals. This broad definition gave the participants a high level of freedom to make associations to activities which they linked to digital play. A similar approach was used by Jack & Higgins (2019). They chose not to define the concept educational technology, to find out what preschool teachers thought it meant. It can also be argued that the broad definition of digital play, applied in the present study, enabled the study of adult-initiated and adult-guided playful activities,

which Zosh et al. (2018) claim needs to be researched. Another potential issue with the digital play concept is that it might give the impression that digital play is profoundly different from the play that does not involve digital technologies. However, Marsh et al. (2016) could see that the nature of children's play changed more than the types of play possible in digital contexts. Regarding the nature of children's contemporary play, they claim that children in the digital era can make use of the digital and the non-digital properties of things, and that they can move fluently across boundaries of space and time in a way that previously was not possible.

Digital play in Swedish preschools

The recently changed preschool curriculum (Lpfö, 2018) states that preschool teachers need to ensure that every child gets opportunities to use digital tools in a way that stimulates development and learning. According to the curriculum, the education should give children opportunities to develop adequate digital skills, by enabling children to develop an understanding of the digitalisation they encounter in everyday life. Children should also be given opportunities to develop a critical, responsible attitude towards digital technology, so that eventually they can identify opportunities, understand risks and be able to evaluate information. These descriptions point out a direction in which preschool teachers should support children's digital competence. However, the curriculum also leaves room for preschool teachers to make their own interpretations regarding the use of digital technologies. According to Kjällander et al. (2019) preschool teachers need to know what kind of digital tools to use, when, how and why to use them, and they need to know when not to use the digital tools. A potential factor of concern is that Swedish preschool teachers seem to perceive the educational value of implementing digital play differently. Some have embraced the pedagogical use of digital play (Marklund, 2015), others approach it with caution (Marklund & Dunkels, 2016) or even reject digitalisation of their practice (Waldorfskolefederationen & RWS, 2016). This situation becomes a concern, as preschool teachers' perceptions are known to affect how and how much digital technologies are being used (Blackwell, Lauricella & Wartella, 2014; Kerckaert, Vanderlinde & van Braak, 2015). In addition, Palaiologou (2016) could see that some preschool teachers avoided digital technologies in their work, even though they were digitally competent, due to a dominant ideology of using traditional, non-digitised play, in preschool. She also found that some preschool teachers are hesitant regarding the implementation of digital technologies. This is confirmed by Hernwall (2016), who found that some preschool teachers think of digital technologies as a threat to their practice.

Statistics reveal that many Swedish preschools still have work to be done when it comes to digitalisation (The Swedish National Agency for Education, 2016). 64 percent of the preschools lack formal requirements such as a plan for how IT is to be used, 50 percent of

the preschool teachers claim that they need further training and 33 percent of preschools use IT with their children less than once a week. It remains to be seen how the new curriculum (Lpfö, 2018) will influence this over the coming years. Marklund (2019) identified some challenges for digital play integration in preschools to be reluctant parents and colleagues, limited time and opportunities for preschool teachers to learn about digital play and that the constant technological development. This suggests that Swedish preschool teachers will need to be supported in more ways than the new curriculum guidelines in order for digitalisation of their practice to become successful.

Affordances of digital play integration in preschools

Bølgan (2012) presented the following argument for increased pedagogical implementation of IT in preschools, about the time when tablets started to be introduced in preschool pedagogy:

It is not the digital tools in themselves that are interesting, but how they can support the child's experience to master, develop and create coherence between kindergarten practices and the technological life children experience at home. (p.164)

Bølgan (2012) predicted that innovative forms of play and learning would take place in learning environments where children were given access to digital technologies, if the digital technologies were used as multifunctional tools that were integrated with other activities. Similarly, Gulz et al. (2019, as cited in Kjällander & Riddersporre, 2019) argue that there is an interplay between children's digital play and their activities in the physical learning environment, and that the use of an app does not necessarily mean that the children's work with physical objects in preschool will decrease. Heikkilä and Mannila (2018) present one of the latest innovative forms of play and learning in the activity to debug analogue versions of programs and debug programs that control programmable robots, designed for child use. They found the activity to be multimodal and socially established, where children used speech, pointing and gaze in their communication.

Palmér (2017) argues that programming activities can be used to teach children elementary mathematics in preschool. Heikkilä and Mannila (2018) motivate the need for this new teaching approach in a similar way as Bølgan (2012) does, regarding the importance to recognise the use of IT in preschool pedagogy. They claim that digitalisation transforms society, and that children need to understand the forces that are driving this change, and the possibilities and challenges involved. According to Ralph (2018) a common concern among preschool teachers is that the use of tablets might lead to antisocial behavior. However, her case study indicated the opposite, that actions of prosocial sharing behavior were more common when children collaboratively worked on tablets. The social aspect of children's digital play is confirmed by Arnott (2016), who could see that children played collaboratively, used a variety of ways to interact and

displayed different degrees of social participation. Masoumi (2015) investigated how three Swedish preschools integrated IT in their practice and found that it was used mainly in five areas: to enrich existing practices, as a cultural mediator, as a way to entertain children, as a tool for communication and for documentation. Finally, several studies have reported on how preschool teachers use digital play to develop children's school-oriented knowledge (Hernwall, 2016; Marklund & Dunkels, 2016; Otterborn, Schönborn, & Hultén, 2019; The Swedish National Agency for Education, 2016).

The role of preschool teachers who introduce digital play

Research suggests that preschool teachers' intentions with the pedagogical use of digital play is important for children's learning outcomes. Genlott & Grönlund (2016) argue that preschool teachers need to take on the role of introducing and implementing digital technologies in a proper way if the use is to become a lever for children's learning. Morgan et al. (2016) claim that digitalisation has small but positive effects on learning in general, but that the positive outcomes can be improved if digital technologies are being implemented as a part of the education and with clear goals, which is supported by Kearney, Schuck, Burden, and Aubusson (2012). How preschool teachers organise the digital play activities will also have implications for the educational potential. Lawrence (2018) suggests that preschool teachers should implement a form of digital play that is collaborative and non-competitive, and that monitoring of peer play is important in order to reach that objective. Walldén Hillström (2014) confirm the pedagogical value of collaboration and claim that the level of digital competence training is dependent on the collective work of the participants. Besides the opportunity to support children's collaborative skills with digital play, preschool teachers are also encouraged to consider the opportunity to adapt the use of digital play to children's individual needs. Kearney et al. (2012) argue that teaching with mobile technologies needs to be done in an authentic way that enables opportunities for personalised learning as well as collaboration. Kucirkova & Flewitt (2018) describe digital personalisation as a combination of practices, products and processes that can take various forms and that can be used to fulfil different purposes in the preschool learning environment.

Preschool teachers' participation in children's digital play also seems to be important. Kjällander & Moinian (2014) found that preschool children's creativity and playfulness makes it hard to anticipate if children will use an app in line with its intended didactical design. Marsh et al. (2016) describe this trait of children's digital play with apps as transgressive play. Similarly, Lindahl & Folkesson (2012) argue that preschool teachers need to develop strategies to create open ended learning activities with the use of IT and that they need to develop an ability to observe and respond to children's initiatives. Sandvik et al. (2012) also stress the importance of teachers having explorative conversations with children in educational situations where IT is used. Nilsen, Lundin,

Wallerstedt, and Pramling (2018) found that the use of a digital and an analogue memory game can turn into different activities from a pedagogical perspective, which suggests that preschool teachers need to reflect on the pedagogical outcomes of the digital play activities that they choose to implement. This is supported by Palmér (2015) who could see that different apps influenced preschool teachers' level of communication with children differently. In addition, Merchant (2015) claim that the lack of well-designed apps together with a perhaps too strong belief in the intuitiveness of the technology are concerns for future research and development. For instance, Marklund (2015) identified that Swedish preschool teachers failed to consider characteristics and affordances of different kinds of apps in online discussions.

The choice of apps for preschoolers' digital play

According to Kjällander and Riddersporre (2019) preschool teachers now have increased opportunities to choose what kind of digital tools they want to use, as the market concerning qualitative apps for preschool use has matured. However, other studies have reported that apps often lack qualities that would make them useful in a preschool context (Falloon, 2013; Merchant, 2015), and that some preschool teachers find it challenging to find and select useful apps (Marklund, 2015; Marklund, 2019). Flewitt, Messer, and Kucirkova (2015) found that preschool teachers do not want to be reduced from professional educators to become merely suppliers of repetitive content, and therefore they argue that preschool teachers' opportunities to plan for their teaching is important for efficient integration of tablets.

Regarding the choice of apps, Petersen, Evaldsson, and Kjällander (2015) suggests that apps which enable auditive, visual or corporeal modes of communication can enhance children's agency, or active participation in digital play. This is confirmed by Palmér (2015) who argues that apps influence child participation and dialogue differently. Similarly, Falloon (2013) stresses the importance of apps matching the learning characteristics of the target student group. He promotes apps that have an appropriate blend of game, practice and learning components and would like apps to communicate learning objectives in ways that young children can understand, that pathways to achieve goals should be smooth or free from distractions and that apps should incorporate formative corrective feedback. Lynch & Redpath (2014) make a distinction between two kinds of apps and argue that with closed apps the learners become consumers of knowledge and with open-ended apps they become producers of knowledge. Kjällander and Riddersporre (2019) confirm how preschool teachers and children seem to prefer to use open-ended apps that have a variety of possible solutions and allow children to explore and make several attempts to find solutions. Jahnke & Kumar (2014) argue that research on teachers who are implementing tablets could help increase the level of understanding among teachers who question the educational potential of digital play.

Kjällander and Riddersporre (2019) point out that this technology is already present in preschools, the question is how the preschool teachers will choose to relate to it. In addition, Lawrence (2018), claims that preschool teachers' insecurities about digital play partly could be explained by the fact that existent literature rarely highlights what children's digital play look like, and how digital play can be used in preschool settings. Consequently, it becomes interesting to bring attention to preschool teachers' thoughts about pedagogical use of digital play.

Purpose of the study

The purpose of the present study was to increase the knowledge about preschool teachers' experiences from pedagogical use of digital play.

Theoretical framework

The analysis of the present study was performed inductively, without the help of a theoretical framework in the process of organising the data into themes. However, some kind of theoretical backdrop, that could enhance the understanding of the participants' professional learning situation, was needed in order to make the discussion of the findings more contextualised. The framework Learning in working life (Illeris, 2007, See Figure 1), was chosen for this purpose, and it illustrates the complexity of how a workplace practice is developed. In the present study the focus is on preschool teachers' workplace practice in pedagogical use of digital play. According to the framework, a workplace practice evolves through a process of interactions between individual worker's objectives and the social dimension of work. For instance, in the context of preschools, some preschool teachers will identify incentives to learn about, and promote, pedagogical use of digital play at work. However, within the social-cultural learning environment, at the social dimension of work, colleagues might identify incentives to resist the new content of digital play in the practice, which ultimately will influence how digital play can be implemented in the workplace practice. Moreover, the technical-organisational learning environment can influence preschool teachers' incentives to approach digital play, as it includes preschool teachers' opportunities to learn and the formal requirements of the profession. According to the framework, a societal level surrounds a work context, and the workers and a workplace practice, can thereby be influenced from developments in the surrounding society. According to Illeris (2007), important workplace-learning takes place in the overlap between workers' work identity and the workplace practice. The framework also acknowledges the fact that workers primary objective is not to learn, it is to produce products or provide services. This aspect of the framework seemed to be in line with preschool teachers professional learning situation (Mertala, 2017), which contributed to the decision to make use of the framework to support the discussion of the findings.

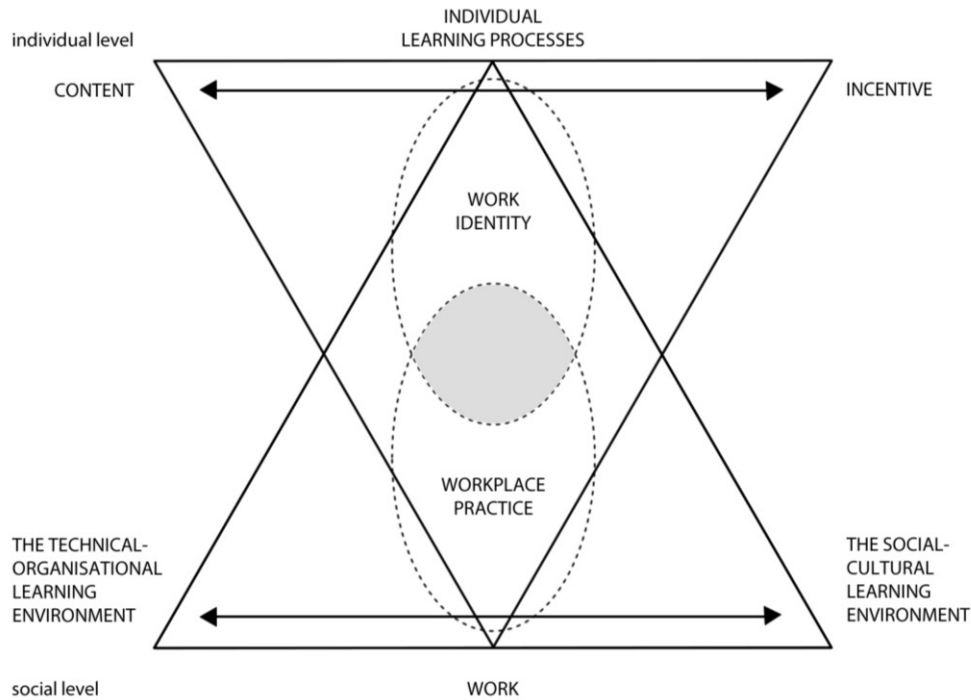


FIGURE 1 Learning in working life (Illeris, 2007, p. 223).

Method

Procedure

Free-standing and municipality driven preschools were invited to participate in the present telephone interview study. Preschool leaders were used as gate-keepers (Crowhurst & Kennedy-Macfoy, 2013), and they located participants who had a preschool teacher education and professional experience from the use of tablets and digital play. In the first contact, the participants were informed about the study and the interview was scheduled. An online communication software was used to conduct the interviews, but the participants used the phones they normally would use. Before the interviews the participants were informed about how their confidentiality would be assured, and they all participated during working hours. The interviews were 40 minutes long and semi-structured (Kvale & Brinkmann, 2014), as the interviewer was adaptive in the choice of questions and followed up on interesting topics. After eleven interviews a satisfactory level of saturation (Mason, 2010) was reached. The interviews were transcribed in full to support the analytical process.

Participants, materials and analysis

The eleven participants worked as preschool teachers in six different municipalities. They were between 27 and 45 years old, two male and nine females. They had worked between 2 and 20 years, seven of them had 7 or more years of experience. Most participants worked with a mixed group of children, aged 1-5 years. One participant worked with younger children, aged 1-2, and another participant worked with older children, aged 5-6 years old. Five participants had access to one tablet in their practice and the remaining six had access to two tablets.

The interview guide contained questions about the participants' pedagogical use of tablets and digital play and questions about their perceptions about this use. The data was analysed using an inductive approach to thematic analysis (Braun & Clarke, 2006). In the first reading of the transcribed interviews, statements that were linked to the pedagogical use of digital play was placed in a separate document, which thereafter was read repeatedly and coded. The codes were condensed interpretations of what the participants talked about, and they were also placed into a visual representation software where the codes were collated and structured into themes and sub-themes. Thereafter, an additional document was created, containing a table for each theme. The data was processed once more and copied into the corresponding theme table, which provided an overview of each theme and made it possible to ensure that the themes, and the quotes that was chosen to exemplify each theme, illustrated the participants' statements properly.

Ethical considerations

The ethical guidelines of the Swedish Research Council (2017) were followed. The participants were given information about the purpose of the study, they participated voluntarily and gave their informed consent that their shared information could be used for research purposes. They were assured that the handling as well as the storage of the information gathered would be confidential and safe. For instance, the geographic location of the study was held secret, as well as the name of the participants and their preschools.

Results

Three main themes were found; Enhancement of pedagogical opportunities with digital play, Digital play for learning and Preschool teachers' ways to develop the pedagogical use.

Enhancement of pedagogical opportunities with digital play

Most participants thought digital play provided additional pedagogical opportunities. One participant mentioned how she, in conversations with hesitant colleagues, argued for the use of digital play by emphasising that it should be used to enhance existing teaching practices, not to replace them:

We should give children as many opportunities as we are able to give, and there are loads of opportunities in a tablet.

Another participant shared a similar thought:

I think that digital play can make it fun again, it adds variation, and as they say, variety is the spice of life. Playing a memory game on a tablet can be a thousand times funnier than in real life. [...] You can meet all children. I'm thinking that children are different, they need different things. Some children might feel better, and learn better, if it is presented in another way, with digital technologies. It is all about the opportunity to make adaptations, and I believe digital technologies can assist in achieving that.

None of the participants explicitly mentioned the need to develop children's digital competence. A few mentioned how children often learn how to use the tablets at home. One participant argued that the goal of merely learning children how to operate technology had become outdated, because the tablets were so user friendly. Five sub-themes were found, that represent how digital play was perceived to enhance the learning environment.

Enhanced creative work

Digital play added opportunities for children to work creatively in preschool. Children's opportunities to work with movie, music and image creation, were mentioned, and one participant said:

Instead of just receiving, for example when we watch movies, it is possible to work in another way, to create videos ourselves.

Another participant described such an activity:

Our children have done creations out of waste material, different spacecrafts, and they created space movies by taking still pictures and thereafter they edited them into a movie.

A third participant mentioned how a music production software provided a chance to explore a more diverse range of musical instruments, beyond the maracas and tambourine that many preschools are restricted to when it comes to physical instruments:

Now we can look at, for instance a drum-set and listen to how it sounds, a violin and how it sounds.

Enhanced documentation

All participants thought that work with pedagogical documentation had been enhanced since they introduced tablets. This work enabled reflection and communication, where tablets were perceived as an accessible technology which allowed immediate ways to process the documentation and instant opportunities to discuss the outcome with colleagues, children or their guardians. One participant stated:

We are about to conduct child interviews, and the idea is that we will interview them with the use of photos on the tablet. That we pose questions like: Do you remember when we did this? How did it feel? And in such ways, it is a very good support.

Many of the participants aimed to make the children involved in the work with pedagogical documentation, as a way for the children to get familiar with how to use digital technologies for specific purposes, and thereby this activity became a part of the children's digital play. One of these participants said:

The objective must be that it [the tablet] is something that the children can have access to, and that they know how to make use of it.

Another of these participants described the following ambition:

We are working on the issue of giving children ownership of the tablet. That it should be their tool, to make documentations of each other and their things. Now, they more frequently say: I have done this, and I am about to tear it down, can I take a photo of it first? [...] That the children should have increased ownership of it, both in the indoor and in the outdoor environment. [...] It is exciting to let go of the app-centred work.

A third of these participants explained how such documentations have the potential to help children, as they more easily can restart an activity if they get to see some photos or a video of what they did the previous time.

Enhanced access to information

The way tablets make information accessible were appreciated. One participant mentioned how this becomes valuable in relation to children's curiosity and interest to learn:

Now, when we have had five-year-old children, they sometimes pose more advanced questions which we cannot always respond to instantly. Then we can Google things on the tablet, and it is frequently used for that purpose.

Others mentioned how online information was a source of inspiration regarding pedagogical approaches and ways to organise the learning environment, in digital as well as traditional play.

Enhanced by new pedagogical activities

To use tablets in combination with other technologies, projectors and speakers, to enable new forms of pedagogical activities that rely on visual or auditive media presentations, were appreciated among the participants, and one said:

Our children like music, we combine the tablet with the projector so that we get a projection on a big white wall. It can be some kind of dance, or some kind of music they like at the moment. Or video-clips, we can ride the roller coaster, we can find a video where someone rides a roller coaster. The children can sit down and pretend to tag along.

Some participants mentioned how the projector was used to illustrate, and in a virtual way expose children to different environments or phenomena. For example, by showing the children the northern light. Several participants had or intended to create physical boxes for this purpose. Boxes that the environments or phenomena could be projected into, large enough for the children to enter, and thus they could become more emerged in the experience. One participant mentioned how a game, originally intended for cats, in which they were supposed to catch insects, turned into a playful activity in combination with a projector:

The children used soft bags, which they threw against the wall when the insects appeared. Simultaneously as I sat down with the tablet and pressed [the insects whenever it was a direct hit]. They had a lot of fun with that.

Another participant said:

We want to buy more projectors, that can be used in combination with a tablet, and increase the opportunities to create completely different kind of learning situations.

Enhanced access to pedagogical material

The way games and applications, additional pedagogical material, becomes available via the tablets were appreciated. One participant stated:

There are quite a lot of pedagogical apps available that could be used to enhance skills with letters, numbers, shapes and colours. It is obvious that they catch children's attention, and that children learn because they think it is fun. They don't experience it as a learning situation.

Another participant said:

Dependent on what games they play, they will learn different things, for instance the skill to write. Learning letters and numbers in another way than if we show them on a piece of paper or an image.

Digital play for learning

Learning for school with digital play

The participants mentioned different ways in which digital play were used to prepare children for the school context. For instance, to support children's language and mathematical skills as well as social skills, such as; collaboration, communication and how to behave in conflicts. Moreover, this theme includes the way digital play is being used to promote children's physical movement and ability to work in theme-oriented projects. One participant stated:

On the tablet I have chosen to divide things into folders. Mostly for my own sake I have made divisions between language, mathematics, technology, natural science and multi lingual apps, to get them organised, but also for the purpose of informing colleagues about what kind of pedagogical apps they are.

Another participant mentioned how they had used an app to display dramatizations of commonly appearing conflicts in-between children. This enabled the children to collaboratively solve conflicts, through discussions about social skills and behaviour.

Learning for the contemporary society with digital play

This theme represents how participants had identified opportunities to teach children about the contemporary society, which they believed would be hard to achieve without the presence of digital play in their practice. One participant emphasised ethics and critical reflection:

The creation of photos and videos raise important ethical questions. It is important that it is agreed upon, that you ask your friends if it is okay to make a video of them right now. It is important they get this perspective, because the opportunity to take photos and videos are everywhere, and they need to learn some critical thinking and ethics, how to do it in a proper way.

Others talked about how children's work with videos and digital images, brought awareness and a deeper understanding off such contemporary phenomena:

I have showed them what stop-motion movies are, and it creates a completely different level of understanding about how movie-making works. [...] These kinds of understandings can be hard to attain with the traditional toys we have.

Another participant stressed the importance of information seeking:

I'm thinking, that the tablet should also be considered as a tool that children can use to search information, because that is the way they will use it in the future.

Ways to develop the pedagogical use of digital play

Towards increasing teachers' pedagogical knowledge and control

All participants argued that digital play should be used intentionally, with an assigned purpose and goals for the activities. Many of the participants wanted to develop their knowledge about how to use digital play in the preschool learning environment. They wanted to increase their knowledge of how digital play can influence children's learning and their ability to adapt digital play to children of different ages. A few mentioned that they strived to avoid improper use and any potential risks that could be associated with children's digital play. They also explained how they selected and used apps intentionally. Apps that could be linked to curriculum goals, to theme-related projects or to children's individual learning interest were used in the practice. Some participants mentioned how children and guardians sometimes suggested apps, but such apps were only put in use after a thorough consideration of how they would contribute to children's learning. Apps that had been recommended in work-related magazines, by other colleagues, or apps that had been externally evaluated on pedagogical websites, were trusted. The trend among these participants was to use apps that they were familiar with from a pedagogical perspective, limit the number of apps in use, and assure that the apps in use were of a perceived high pedagogical quality. The participants avoided apps that were based on characters that children know from child-oriented media, free apps with advertisements and apps with the feature to buy inside the app. Some preferred to pay for apps to avoid such characteristics. Moreover, apps in Swedish were preferred, but apps that provided language recognition and means of communication with children of a multi-cultural background were appreciated. Some also wanted apps to be age appropriate and harmless. A few participants mentioned a central feature of the apps they install for pedagogical use, that they should leave room for children's exploration and reflection, and thereby not be too obvious regarding what is right and wrong.

Towards increasing children's access and agency

Most participants mentioned that they would like to be able to treat tablets and other kinds of preschool material equally. They wanted to increase children's access to tablets, but all participants had not developed functional approaches to achieve this goal. One participant mentioned how they occasionally gave children access to the tablets, but that their ambition was to increase children's access. The fact that tablets are expensive,

together with the concern that children would become too attached to digital play restricted this ambition. Another participant made the following statement:

Yes, it draws a lot of interest, but only in the beginning. We sometimes say, It's the same as when we present a bun, everybody wants it. But when we have introduced it, and had it in the environment a while, their interest fades off. But it is still popular.

Another participant had realised that increased access to tablets, in combination with the approach to restrict digital play to one app at the time, made children treat tablets similar to other materials.

They can never exit the app, and then they can work until they have finished. It can be 20 minutes or 3 minutes, and then they say: I don't want to do this anymore. Then they leave it on the table and perhaps someone else want to do some work, in the same way as when you leave pencils on a drawing table.

Most participants thought that tablets had a limitation when it comes to how many children that can be given access at one time, and they seemed to think that a simultaneous use of about four children were the limit. However, some had started to use projectors to include a larger number of children in the digital play activities they presented. One participant stated:

You cannot sit 25 in front of a tablet; however, you can combine it with a projector and then more can participate. We don't intend that one child should use the tablet, because all learning takes place in a context, and therefore we like to see a lot of collaboration and communication around the tablet.

One central part of the strive to increase children's access and agency seems to be to find a balance between digital play and traditional play. Some of the participants expressed concerns that digital play would overtake existing practices. One way to deal with this dilemma were to offer traditional pedagogical activities as alternatives whenever an opportunity for digital play was presented to the children. Some participants argued that this approach increased children's level of agency to choose activity and that they could become inspired to learn from this mix of activities.

After a while of using the tablet, they can also become interested of the physical material. They can be drawn to things that they perhaps normally would not have tried.

Another approach was to use a clock or a schedule to moderate the time children could engage in digital play activities or the number of times children could use the tablet each week. Using a clock seemed to be disliked by many of the participants. They reasoned that they did not monitor children's play with other material in such a way, and thus they wanted to avoid it in digital play as well. Regarding the time, and thereby agency, children have to engage themselves in activities, one participant stated:

I should not be dependent on what you are working with.

Another aspect of children's agency in digital play could be seen in the statement of one participant, who appreciated how online music streaming services had provided access to the kind of music the children liked at the moment, instead of the music that the teachers had chosen for them.

Discussion

The purpose of the present study was to increase the knowledge about preschool teachers' experiences from pedagogical use of digital play. Three main themes were found that respond to that purpose. The theoretical framework of Illeris (2007) will in this section be used to link the participants' experiences to the constituent parts of their professional learning environment.

Enhancement of pedagogical opportunities with digital play

The participants thought digital play added pedagogical opportunities that could be used to enhance, not replace, other pedagogical practices in the preschool learning environment. This is in line with the finding of Masoumi (2015), that IT is used with the intention to enrich existing practices, and the claim of Danby (2013) that the use of technologies can be incorporated into traditional everyday practices. One of the participants explained how she argued for the use of digital play towards hesitant colleagues by emphasising that digital play was no more than an enhancement. This need to argue for the use of digital play supports the findings of Marklund (2019), that preschool teachers' social-cultural environment (Illeris, 2007), is a challenge for preschool teachers who want to use digital play. The participants thought that the use of digital play provided more opportunities in children's creative work, better pedagogical documentation, access to the Internet as a source of information and access to more pedagogical material and to create new pedagogical activities. Thereby the participants had identified several incentives to use digital play (Illeris, 2007). This is in line with the claim of Marklund (2015), that some preschool teachers are willing to implement digital play in diverse ways.

However, the present study has provided more detailed knowledge about how preschool teachers perceive that digital play enhances the practice. These perceived enhancements share resemblance with the other categories found by Masoumi (2015); that IT is used as a cultural mediator, as a way to entertain children and as a tool for communication and documentation. For instance, the participants also linked pedagogical documentation to increased opportunities for communication with the children, their guardians and colleagues. Moreover, the way the participants used digital play to enhance children's

creative work seem to share resemblance with what Masoumi (2015) refers to as a cultural mediator. The fact that the participants did not aim to replace other pedagogical practices with digital play are in line with studies that has showed how some preschool teachers safe-guard the traditional practices in times of digitalisation (Hernwall, 2016; Palaiologou, 2016). Most participants seemed to appreciate the opportunity to adapt preschool education to children's individual needs by the additional pedagogical opportunities. This is in line with what Kurcirkova & Flewitt (2018) describe as digital personalisation, a combination of practices, products and processes that can be used to fulfil different purposes in the learning environment. The participants had also identified how traditional and digital activities sometimes enhanced each other. They could see how children got tempted to approach activities they normally would not be interested in, when they were given the opportunity to choose between similar digital and traditional activities, which also has been identified by Gulz et al. (2019, as cited in Kjällander & Riddersporre, 2019).

Digital play for learning

The participants had two teaching objectives in their pedagogical use of digital play. The first teaching objective was to prepare children for school, which has been declared in other studies (Hernwall, 2016; Marklund & Dunkels, 2016; Otterborn et al. 2019). The participants used digital play to support children's language and mathematical skills, which is in line with the findings of Hernwall (2016) that preschool teachers use digital technologies to support specific competences. The participants were also convinced that children's learning would be enhanced if children collaborated in digital play activities, and that digital play activities provided opportunities for collaboration and communication. This is in line with the findings that children use social behaviour and communicates in digital play (Arnott, 2016; Ralph, 2018) and studies that stress the importance of collaboration in children's digital play (Lawrence, 2018; Walldén Hillström, 2014).

The second teaching objective was to prepare children for life in the contemporary digitised society, which also has been identified in the study of Marklund (2019). Thereby the societal level of the participants' professional learning environment (Illeris, 2007) increased their incentives to introduce digital play. The participants recognised the need to change educational content, and educational practices, in a way that follows the development in the surrounding society (Bølgan, 2012). At the time of data collection, they did not use the newest teaching approach of elementary programming (Heikkilä & Mannila, 2018) in their teaching. However, they seemed to use the potential to address other contemporary phenomena that children encounter in their lives, for instance; information seeking on the Internet, movie creation and the creation of digital images, which is in line with intentions of the curriculum (Lpfö, 2018). One of the participants

argued that the need to develop children's skills to operate digital technologies had become outdated because of how tablets were so user friendly. This statement illustrates how the content (Illeris, 2007) of digital play is special, due to the technological development.

Ways to develop the pedagogical use of digital play

The participants talked about how digitalisation is an ongoing process in their profession, in which they want to develop their pedagogical use of digital play in two directions.

The first perceived need of development was to increase preschool teachers' pedagogical knowledge and control. Regarding knowledge, it was apparent that the participants thought about how tablets and digital play could be implemented in an authentic way in their practice. They carefully considered the purpose of the activities and how they could be linked to curriculum objectives, which according to Morgan et al. (2016) is important in order to increase the usually small but positive learning outcomes of digitalisation. The participants wanted to increase their knowledge about how to use digital play in preschools, how digital play can influence children's learning and be adjusted to children of different ages. The participants' perceived need of further training is understandable in relation to their generally limited opportunities to engage in further training (Mertala, 2017), but also considering the complexity of pedagogical use of digital play.

Preschool teachers need to be aware that children, by their playfulness, or transgressive play, can transform apps' digital didactical design, which means that the pedagogical intentions behind the choice to introduce an app can be lost (Kjällander & Moinian, 2014; Marsh et al., 2016), that digital versions of traditional learning activities may lead to other learning outcomes (Nilsen et al., 2018), that preschool teachers need to develop strategies to create open-ended learning activities and an ability to observe and respond to children's initiatives in digital play (Lindahl & Folkesson, 2012) and that preschool teachers ability to communicate with children can alternate between different apps (Palmér, 2015). Even though the participants perceived that they had certain limitations in their pedagogical knowledge about digital play, it was evident that they were aware of the importance to introduce and implement digital technologies in a proper way (Genlott & Grönlund, 2016), mainly because of the way they had clear pedagogical goals in mind and the way they seemed to implement digital play as a part of preschool education (Morgan et al., 2016).

Regarding control, the participants wanted to increase their level of control over digital play activities. For this reason, the participants used apps that they were familiar from a teaching point of view, they limited the number of apps and made efforts to confirm that the apps had a high pedagogical quality. Thus, it seems as if the participants progress slowly in the digitalisation process, which is in line with claim of Flewitt et al. (2015), that

preschool teachers' confidence and time to plan are important factors for efficient integration of tablets, and that preschool teachers do not want to be reduced from being professional educators to being merely suppliers of repetitive content, that is, suppliers of apps. The participants had a purposeful selection of apps, where some participants explained how they preferred apps that leave room for children to explore and make reflections, which support the study of Kjällander and Riddersporre, (2019). Moreover, the participants' preferences concerning apps seem to be similar to the app characteristics that Falloon (2013) promotes for preschool use. However, his suggestion that apps should incorporate formative corrective feedback, was not an explicit preference among the participants in the present study. Instead, they emphasised an interest in apps that are open-ended, and make the children become producers of knowledge (Lynch & Redpath, 2014).

The second perceived need of development was to increase children's access and agency. Regarding children's access to tablets, which is inherently linked to children's agency in digital play, the participants reasoned in different ways. Some participants were still worried that digital play would affect children's social behaviour, in the sense that they were afraid the children would become too attached to the tablets, which is in line with the findings of Ralph (2018). The participants used different approaches to make tablets become more similar to other material in the learning environment. The fact that children had free access and no time restrictions when they played with other kinds of material made the participants want to reach a similar way of working in digital play activities. The participants tried different approaches to work around some pedagogical challenges, and thereby they had avoided to look upon digital technologies as a threat to the preschool practice (Hernwall, 2016). These approaches seemed to be important in order to organise activities in the learning environment but they were also important from the point of view that they enabled an increased level of freedom for children in the digital play activities, which thereby enhanced children's agency. Thereby, the participants were aware of the importance to retain children's agency in digital play activities (Zosh et al., 2018), but from this study, it cannot be concluded if the participants linked increased agency to improved learning outcomes for the children.

It may be that the participants aimed for increased child agency in digital play activities because it was more in line with how they were used to work. The approaches were to; increase children's access to tablets in combination with restrictions on children's time to use them, the number of times per week children could use the tablets or that children's access was limited to one app on every digital play occasion. The purpose seemed to be to maintain a proper balance between traditional and digital play activities in the learning environment. The insight to such approaches, and the knowledge that children's access to digital technologies and children's agency in digital play activities are key areas in which preschool teachers continue to develop their pedagogical use of digital play, are important

findings of the present study. Moreover, the present study could potentially increase the level of understanding among the preschool teachers who hesitate regarding the educational potential of digital play (Jahnke & Kumar, 2014), as it provides insight to the workplace practice (Illeris, 2007) that preschool teachers have developed in pedagogical use of digital play. As the new curriculum (Lpfö, 2018) makes support of children's digital competence a mandatory part of preschool teachers' work and as preschool teachers in Sweden have diverse opinions about the value of digital play implementation (Marklund & Dunkels, 2016), it may be fruitful to establish support for preschool teachers' professional learning.

Conclusions

It can be concluded that the participants stated that their pedagogical use of digital play aimed to enhance, not replace, formerly established pedagogical practices in the preschool learning environment. Digital play was perceived to enhance the learning environment by more opportunities in children's creative work, better pedagogical documentation, access to the Internet as a source of information, access to more pedagogical material and opportunities to create new pedagogical activities. Moreover, the participants stated that they used digital play intentionally, with the purpose of the digital play activities and the curriculum objectives in mind. Two main teaching objectives were identified in the participants' statements, to prepare children for school and for life in a digitised society. Hence, the participants had begun to establish certain parts of their workplace practice in digital play. The participants had a work identity (Illeris, 2007) that welcomed the use of digital technologies in preschools, and thereby it should be made clear that these conclusions do not represent the whole population of Swedish preschool teachers. The participants also stated that they wanted to develop the pedagogical use of digital play by increasing children's access to tablets and agency in digital play activities. Moreover, they wanted to increase their pedagogical knowledge about digital play and they wanted to be in control over the digital play activities that they introduced in their practice.

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