Don't Ask Me Why: Preschool Teachers' Knowledge in Technology as a Determinant of Leadership Behavior

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Abstract

In the Swedish preschool curriculum, technology education is emphasized as one of the most significant pedagogical areas. Particularly, the teacher's role is emphasized: It is the preschool teacher's responsibility to stimulate and challenge children's interest in science and technology. Unfortunately, prior research indicates that preschool teachers feel uncertain about what technology is and the extent of their knowledge on the topic. Based on the path–goal theory, this article will explore how preschool teachers' knowledge of technology influence how they act toward children in different learning activities. Using a qualitative research design, this study collected data comprising 15 interviews with preschool teachers. The result provide insights for how teachers limited knowledge in technology influence their leadership behavior toward children both in planned activities initiated by teachers and in unplanned activities initiated by children during free play. The core of how teachers' knowledge in technology influences their leadership behavior in these two types of activities is their ability to deal with children's *why* questions. The results also show that a compensatory approach becomes evident in teachers' leadership behavior toward children in planned activities and that an avoidance approach is evident in unplanned activities. Our findings suggest that the development of a problem-solving approach in unplanned activities could enable teachers to create learning environments for children in which technology becomes something natural. Moreover, enhanced knowledge and understanding of technology will in turn make teachers better able to explain and clarify concepts and various technical phenomena.

Keywords: Leadership, path–goal theory, preschool, technology

Today, children are growing up in an environment in which everyday technologies and advanced technologies are evolving at a rapid pace. Computers, mobile phones, and other advanced technologies are available in almost every home and workplace. The ability to communicate and apply new knowledge is necessary in a society characterized by a huge flow of information (Williams, 2002). To embrace and facilitate the use of all the technologies that children encounter in everyday life, it is essential that they have a basic understanding technology. In Sweden, the preschool educational mission addresses the importance and significance of integrating technology in the education of young children. In the new Swedish preschool curriculum,

technology education is emphasized as one of the most significant pedagogical areas. It puts particular emphasis on the teacher's role, emphasizing that it is the preschool teacher's responsibility to stimulate and challenge children's interest in science and technology (Skolverket, 2016). Thus, as part of their leadership, it is crucial for preschool teachers to have the appropriate knowledge to distinguish and highlight technology in children's everyday lives to facilitate children's learning. Unfortunately, prior research has shown that many preschool teachers feel uncertain about what technology is and the extent of their knowledge on the topic (Plowman, Stephen, & McPake, 2010; Siu & Lam, 2005; Smith, 2001). According to a Swedish Schools Inspectorate quality report (Skolinspektionen, 2012), in-service preschool teachers express uncertainty and even fear regarding technology, viewing it as something unknown. For example, teachers seem to have different perceptions of what technology is and, in many cases, understand technology strictly as electrical equipment, such as computers and televisions (Skolinspektionen, 2012; Smith, 2001). Teachers commonly associate technology with high-tech artifacts and focus on the use of these artifacts rather than their structure or the process that led to their development (Siu & Lam, 2005). Furthermore, preschool teachers experience technology as complex and difficult to manage (Plowman et al., 2010; Siu & Lam, 2005; Skolinspektionen, 2012). This trend is worrisome. To date, prior research has focused on investigating preschool teachers' knowledge of technology. Less attention has been paid to the actual influence of preschool teachers' knowledge on their leadership behavior toward children, that is, how preschool teachers act toward children in technology-related activities and how this might affect learning outcomes for children. We propose that addressing this can provide new avenues through which to understand how to facilitate children's learning about technology. The aim of this article is to explore how preschool teachers' knowledge of, and approaches to, technology influence how they act toward children in different learning activities.

Technology is part of the preschool environment and provides the children with experiences of everyday phenomena. From there, children will have the opportunity to build their perceptions of how technology can be used, among other things, to facilitate and solve problems in everyday life (Skolverket, 2016). First and foremost, this includes their ability to discern the technical objects of everyday life and become acquainted with them. In this way, children are given opportunities to reflect on issues concerning the use, benefits, functions, materials, design, and construction of these objects (Skolverket, 2016). From a Swedish perspective, such situations are particularly interesting because the preschool curriculum considers creativity, play, and enjoyment in learning as the backbone of young children's education. A central activity in preschool is free play. Prior research has shown that through free play, children learn largely by participating. For example, studies concerning children's involvement and participation show that these contribute to their understanding of technology.

This highlights the importance of direct experience in stimulating children's learning (Turja, Endepohls-Ulpe, & Chatoney, 2009; Tu, 2006). Children have an innate curiosity that compels them to discover things for themselves, and when they do so, their first meeting with the science of technology occurs. By participating in technical activities, children develop their investigative skills and learn to discuss, reflect, and formulate thoughts and ideas (Tu, 2006).

However, it is worrisome when children's perceptions of technology are inadequate and their development of alternate perceptions do not change over time (Mawson, 2011). Preschool teachers' ability to enhance children's participation in technology use seems to largely depend on the teachers' own knowledge. Previous research indicates that the teacher's role and behavior are crucial in encouraging children in their learning about technology (Rohaan, Taconis, & Joechems, 2010; Siraj-Blatchford & MacLeod-Brudenell, 1999). Children who receive considerable support and guidance on how various phenomena work have more opportunities to develop technical skills (Mawson, 2011; Stables, 1997; Tu, 2006). In such situations, children need adults with the appropriate knowledge and experience to guide them further (Smith, 2001). Therefore, it is important that teachers get involved in activities controlled by children (e.g., free play) because it is in participating in such activities that children are driven by a strong motivation to achieve a specific goal (Parker-Rees, 1997). Turja, Endepohls-Ulpe, and Chatoney (2009) find that play prompts children to use their imaginations to experiment with alternative plans, solutions, and problem-solving and to combine things in new ways. Practices in which children are only offered materials (e.g., building blocks) without support and must decipher for themselves what these materials can be used for can be counterproductive. For example, if the children build something, the teacher usually does not ask the children if they really understand what they have done. Therefore, the visible result is the dominant criterion in the evaluation of successful technology education (Tu, 2006). Siu and Lam (2005) conclude that if children are to get a basic understanding of everyday technology, they must have an understanding of the process involved in, for example, the construction of a specific technical artifact. When the children need support or help in solving problems or in finding new ways to proceed, the teacher's role in encouraging and being supportive is crucial (Stables, 1997).

Altogether, previous research highlights the importance of introducing technology at an early age to offer children an advantage in school. An early introduction to technology can change children's perceptions of what technology is as they interact with it (Can-Yasar & Uyanik, 2012; Mawson, 2010; Milne & Edwards, 2013; Siraj-Blatchford, 2001; Siu & Lam, 2005). Teachers' knowledge of technology is crucial for encouraging and stimulating the development of children's knowledge of technology and their skills in its use. From a broader perspective, due to the growing need for technical skilled labor, it is important that preschool teachers are aware of how to challenge,

stimulate, and motivate the children's learning of, and interest in, technology (Rohaan et al., 2010).

Theoretical Framework

The aim of the present study was to determine how preschool teachers' knowledge of, and approaches to, technology influence how they act toward children in different learning activities. To derive an understanding of how preschool teachers' actions contribute to children's learning about technology, the study used the path–goal theory framework (House, 1996). *Path–goal theory* is a theory of leader effectiveness that focuses on identifying the effects of the leader's behavior on the subordinates' outcomes. To the extent that subordinates lack support and resources required to accomplish goals, it is the leader's function to provide such support or resources (House, 1996). According to path–goal theory,

> The motivational functions of the leader consist of increasing personal pay-offs to subordinates for work-goal attainment, and making the path to these pay-offs easier to travel by clarifying it, reducing roadblocks and pitfalls, and increasing the opportunities for personal satisfaction en route. (House, 1971, p. 324)

Thus, an effective leader is one who assists subordinates with navigating paths that ultimately lead to organizationally desired and individually valued outcomes.

Path–goal theory has proven fruitful in the field of education. For example, Öqvist and Malmström (2016) employed the theory to expand the understanding of teachers' leadership behavior and its impact on students' educational motivation. From the students' point of view, the authors highlighted the usefulness of the theory to capture how levels of developmental leadership cause low levels of motivation among students. In the present study, path–goal theory helped to explain how preschool teachers' knowledge of technology influences their leadership behavior toward children in different learning activities. Accordingly, if the children need help with solving a problem to achieve a goal (e.g., a playful activity involving building something), the teacher needs to help, support, and motivate the children by clearing away obstacles and discussing possible solutions in order to improve their learning and performance. The children will be motivated to carry out the activity or task if they feel that they are competent and possess the right knowledge to take on and complete the activity. This presupposes that the preschool teacher, as the leader, provides a clear direction and gets involved in the children's goal achievement by supporting and helping the children in different ways. Through their leadership, preschool teachers can influence children's motivation and interest in solving a problem or completing a task (cf. Yukl, 2013). Csikszentmihalyi (1990) and

Dörnyei and Ushioda (2011) show that problem solving leads to motivation. For preschool teachers, then, the challenge is to exhibit behavior that best meets the needs of the children.

Methodology

Sample

The present study adopted a qualitative embedded multiple case-study research design inspired by Eisenhardt (1989) and Yin (2003). Cases of preschool teachers' experiences were used to explore their knowledge of technology and how this influences their actions. The sample included data from 15 interviews with preschool teachers in northern Sweden. The first step in identifying participants was to locate teachers working in preschools. Through a directory of the preschools in various districts in the same municipality, 15 teachers were identified. The age of the teachers ranged from 28 years to 62 years with a mean age of 36 years. The range of experience in the field was from 3 years to over 30 years. The teachers worked in eight different preschools in the municipality. Letters were sent to all 15 preschool teachers through their workplaces; in these letters, they were informed about the study and were invited to participate. The preschool teachers contacted the researchers via e-mail or phone to set up a time for the interview. The names presented in the results are pseudonyms.

Data Collection

In-depth interviews were used to capture the preschool teachers' experiences and their view of reality (Silverman, 2013). For the data collection, an interview guide was developed to guide the researchers in capturing the teachers' experiences. The interviews were conducted with the teacher at their preschool in a room in which only the teacher and researchers were present. On average, each interview lasted about 1 hour. The interviews were recorded using a digital recorder and then transcribed. The amount of data recorded increased the potential of identifying fragmented and complex patterns in the preschool teachers' self-experienced narratives of technology in preschool (Mezias & Scarselletta, 1994). The number of interviews was considered sufficient to meet the study's aims. In other words, saturation was reached, and patterns were clear and validated (Yin, 2003).

Data Analysis

The idea behind this analysis was that social groups construct their own reality (Mumby & Clair, 1997), which is expressed through their representations and experiences (Fairclough, 1992). The approach applied presupposed that socially constructed institutions are produced and made real by the preschool teachers' storytelling and are reproduced in narrative form.

The data analysis was performed in a four-step interpretative process (see Figure 1) inspired by a microanalysis approach proposed by Corbin and Strauss (2015). The first step entailed interviewing the preschool teachers and transcribing the interviews. This involved gaining an initial understanding of the content, which facilitated the next step. The second step entailed manually coding the transcribed data. The coding followed an interpretive approach with repeated feedback between the theoretical framework and empirical data. Inspired by Corbin and Strauss (2015), words and phrases expressed in the preschool teachers' narratives were scanned. To help make sense of the data, a search was undertaken for statements and expressions related to technology that were associated with a set of guiding questions: (a) What are the main arguments about preschool teachers' knowledge of technology, (b) what kinds of technology-related activities are described, and (c) what actions toward children are described? The coding was subsequently grouped into patterns. The third step involved defining categories through the repeated analysis of patterns. The researchers met frequently to compare the emerging categories. Categories were identified with repetitive feedback between categories and patterns, thus following the recommendations of Denzin and Lincoln (2000) and Miles and Huberman (1994). In the fourth and final step, the categories were grouped to generate the basis for three different themes: *knowledge*, *planned activities*, and *unplanned activities* (see Figure 1). Consequently, typical aspects of the preschool teachers' statements were highlighted, illustrating the various themes. In this interpretive process, investigative triangulation between patterns, categories, and themes was used. To establish construct validity, narrative stories and quotes were used to present and illustrate these inductively generated results (Gibbert, Ruigrok, & Wicki, 2008; Yin, 2003). In this way, the researchers observed a high degree of consistency, which can underpin the internal validity of the results.

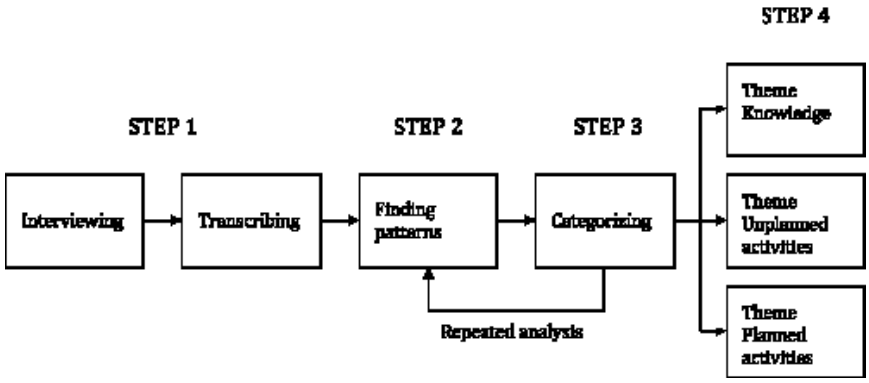

Figure 1. Process of analysis.

Results

The results describe the preschool teachers' knowledge of technology and how this influenced their actions toward children in planned and unplanned activities.

Limited Knowledge of Technology

Within the theme of *knowledge*, the preschool teachers' statements show their views on technology in relation to themselves and their profession. They faced difficulties in defining technology, with many relating it to computers, television, and other technical equipment. As to defining technology in preschool, they expressed that it is about solving problems of various kinds. Maria expressed the following:

> Technology is solving problems. I see a child in front of me who sits and builds a tower, and so it collapses, and everything is all about building the tower right. They need to know how to build it right. Problem solving.

The preschool teachers expressed that the goal of problem solving is that children should learn various technical skills to solve various problems. In problem solving, the child learns a skill, without the involvement of the teacher, explores, and tries out different procedures to finally reach a solution. The teachers also emphasized that the preschool environment offers, through a variety of materials, many challenges for children to work with different kinds of problem solving, both indoors and outdoors.

Besides problem solving, the preschool teachers defined technology as something that exists in everyday life in a substantial way and permeates the most basic needs. Sarah described the situation as follows:

> Technology in preschool exists everywhere in everyday life. When children wash their hands, I say to them that this is technology, and they learn what technology is. If I open the tap, the water comes out, and when I close the tap, the water stops. It is technology.

Sarah emphasized that technology appears in everyday situations. A common way of working with technology is by paying attention to the technology around the students, such as when they open the tap and water flows or when they close the tap and water stops flowing. Thus, focusing on such phenomena and attaching the word *technology* to them has become a strategy that the preschool teachers use when working with children to give them a basic understanding of technology in preschool.

Even when using such strategies and seeming pleased with them, the teachers also discovered problems with this way of teaching children about what technology is. Several preschool teachers expressed concerns about whether they were challenging the children in their learning process in everyday situations. Helen described the following:

> I cannot explain to the children what happens when we switch the light on and off more than simply to say that it is so. I don't have enough knowledge for that, so I do not know what the children learn from this. I cannot answer their questions about *why*. But I do highlight that it is technology even if I can't explain *why*.

The preschool teachers pinpointed that to create a learning situation, the teacher needs the knowledge and ability to explain and discuss different processes of how everyday technology works. They all experienced a lack of this ability, for instance, when Helen described not being able to explain what happens to make the light turns on and off when one presses a button on the wall or when Sarah described what happens when one opens and closes the tap. The awareness of trouble with handling the *why* question is an issue they considered to be a problem in children's learning of technology. For children to gain an understanding of what technology is and how it can be used to explain how things work, it is important to discuss the *why* issue.

In the preschool curriculum, technology is emphasized as one of the most significant pedagogical areas. All of the preschool teachers were aware of that but expressed frustration over their limited knowledge and the fact that they could not live up to expectations. Anne described this as follows:

> The curriculum states that one should distinguish technology in everyday life and explore how simple technology works. If we don't understand what technology is, how do we get children to understand what it is?

Although the preschool curriculum has been strengthened and the teacher's mission has expanded, the preschool teachers found it difficult, and hence challenging, because they do not have sufficient knowledge of technology. If they cannot explain, or even have knowledge of, how a simple technology works, they cannot challenge children and help them understand how it works. This lack of knowledge in dealing with the *why* issue will impact how they act toward the children in technology-related activities that are either planned by them or unplanned and initiated by the children in their free play.

Planned Activities Initiated by the Teacher

Planned activities are activities planned by the preschool teacher. However, the preschool teachers described such activities as being unusual. Planned activities are activities that include teaching materials that provide step-by-step instructions on how to carry out the activity. Issues that may be addressed with the children during and after the activity are included in these instructions. Despite being unusual, the preschool teachers emphasized that these planned activities are the best way for children to learn about technology. Maria stated the following:

> It is important to have planned activities in technology because we challenge the children's learning process by preparing questions for them based on the teaching materials. It is the best way for the children's learning.

A crucial factor for choosing to work with technology in planned activities is the safeness of relying on teaching materials. As Maria highlighted, it provides opportunities to be involved in the activity, and that it is the best way of challenging the children in their learning. This is because the teaching materials often have detailed instructions and describe what happens in every exercise. This enables the preschool teacher to answer the *why* questions.

The guidelines that these materials provide regarding, for example, prepared questions, enable the preschool teachers to handle the *why* issue. Emmy described the benefit of these materials:

> A good thing is that the teaching materials make us active and have prepared answers that we give the children, so they understand how things work. The materials not only give instructions on what to do but also explain what happens, so we can tell the children how to understand the phenomena. This is the key.

The preschool teachers pinpointed that the teaching materials create good conditions for working with technology in preschool. The key in planned

activities is that the teaching materials enable the preschool teachers to take an active approach in working and interacting with the children. The materials provide facts to help the teachers address the *why* issue or, more specifically, to explain what and how different phenomena appear. Thus, it is the teacher who poses questions to the children, not vice versa, and above all, they have the answers to the questions and are able to answer the children's *why* questions. The preschool teachers' experience of the materials is that they enable them to exert control over the situation, especially because they feel prepared and confident to address the children's questions. They highly value this approach to working with technology when they see the learning opportunities that it provides.

Unplanned Activities Initiated by the Children

Unplanned activities in technology are activities that are initiated and carried out by children during free play. Opportunities for free play allow space for children's innate curiosity to discover, solve problems, and create an understanding of the world around them. The preschool teachers pinpointed that preschool should provide children with a safe environment that simultaneously challenges and encourages play and activities related to technology. Furthermore, children should be challenged to explore the world around them, and the activities should provide space for the children to execute their own plans, fantasies, and creativity in play and learning. The preschool teachers also emphasized that children are offered a variety of technical tools in the preschool environment. Elisa described the following:

> Our environments offer building blocks and Lego. We also offer hammers, nails, and pieces of wood collected outdoors that they can build with. But mostly they play with technical material that we have indoors.

Many of the preschool teachers' statements concerned, as Elisa expressed, materials that they connect to construction play and activities that take place indoors. They all expressed that children show curiosity about using technical materials and tools.

Building activities are based on children's natural curiosity and joy of discovery. The children initiate technical activities every day when they, by nature, use play, fantasy, and creativity, especially in construction play. For example, Jennifer described the following:

> It happens every day that children sit and build with blocks and construct houses and towers of various kinds. They are so creative and full of fantasy. Sometimes they have even drawn on paper an outline of what they want their building to look like. They sit and discuss different possibilities and

> solutions to build, for example, a tower, in the best way so that it will not collapse. I mean, that's very creative.

Jennifer described a common unplanned activity in technology initiated by children with a focus on building things. The children sometimes start the activity by drawing a sketch to clarify their thoughts and ideas and what the goal, or final product, is. Based on the sketch, they start to construct. The preschool teachers described how the children use their creativity and fantasy to develop technical solutions and show a natural interest in creating things. A cornerstone of technical skills is being able to express oneself using speech, models, or drawings. In this process, they develop and make comparisons of their own and other constructions, which increases their understanding of the technological possibilities. In working with their own constructions, they learn to detect similar technological solutions in their environment.

Unfortunately, the preschool teachers' limited knowledge of technology influences their actions toward the children in the activities that the children initiate. Sofia stated the following:

> The children get frustrated when it collapses and do not know how to place blocks to build as planned. They often ask us teachers why it collapses and how to build successfully. It often ends with us saying we don't know and that they should try again, and we walk away. We do not know how to explain to the children why it collapses or how to construct the building for it to stand. We don't have the technical knowledge to answer their question. It might sound silly, but it is like this. It often ends with the children becoming bored and switching activities.

The children show an interest in something and are stimulated and challenged through play, environment, materials, and other children. Unfortunately, the preschool teacher's actions do not encourage the children in their activities. Consequently, they do not stimulate the children's learning about technology. When the children's buildings collapse, they ask for support and help from the preschool teachers to get deeper knowledge to continue with the activity. Instead of giving support and encouragement by engaging in discussions with the children to find solutions, the teachers fail to stimulate the children's interest, curiosity, creativity, and motivation to go further. A possible approach is to encourage children to develop and make comparisons between their own and others' construction to increase their understanding of the technological possibilities. In working with their own constructions, they could also learn to detect similar technological solutions in their environment. The situation that Sofia described could be turned into an excellent learning moment; instead, her experience has been that the children stop and switch activities.

Discussion

The aim of this study was to investigate how preschool teachers' knowledge of, and approaches to, technology influence how they act in different learning activities with children. In line with prior research (e.g., Plowman et al., 2010; Siu & Lam, 2005; Smith, 2001), the results show that preschool teachers' knowledge of technology is limited. Moreover, the excerpts from our interviews with preschool teachers indicate how this limited knowledge influences the teachers' leadership behavior toward the children in technology-related activities. Our results provide insights for both planned activities initiated by teachers and unplanned activities initiated by children during free play. The results also show that the core of how the teachers' knowledge of technology influences their leadership behavior in these two types of activities is their ability to deal with children's *why* questions.

A compensatory approach is evident in the teachers' leadership behavior toward the children. It is visible in planned activities initiated by the teachers in which they rely on prepared teaching materials to compensate for their lack of knowledge of technology. These materials also provide tools for dealing with children's *why* questions, such as step-by-step instructions on how certain activities can be carried out and examples of issues to address with the children. Such compensation causes the teachers to prefer working with technology in planned activities, even if such activities are unusual. In unplanned activities initiated by the children during free play, the compensatory approach is replaced with an avoidance approach, evinced in the teachers' leadership behavior toward the children. It is visible, for example, when the preschool teachers are invited to participate in the activity because a child needs support or wants to discuss solutions to go further in the activity. In such an instance, the teacher cannot rely on any teaching materials and has neither the tools nor the knowledge to deal with the child's *why* questions. Instead of support with problem solving to motivate the children, the teachers walk away and avoid interaction while the children carry out these activities.

According to path–goal theory (House, 1971, 1996), preschool teachers' behavior strongly affects their ability to be supportive, motivating, and challenging. Our results show that the teachers' knowledge of technology is crucial because it influences their leadership behavior toward the children. Consequently, such a direction sets limitations for the children's outcomes, such as learning, and one can question how discovery, creativity, fantasy, and problem solving can be motivated in this case. Aligned with Senesi (1998), this implies that an enhanced understanding of technology affects how learning processes aimed at achieving certain goals can be pursued in activities related to technology. This also affects how children are being helped to develop knowledge of technology and technological skills within the preschool environment.

Despite the preschool teachers' experienced inability to challenge children's learning about technology, they are aware of the importance of the children receiving support from their teachers. Thus, to further children's thinking in finding possible solutions to problems, preschool teachers must understand what is required of leadership behavior and must consciously reflect on what is happening in the process. When children are challenged by the preschool teacher with open questions focused on the *why* issue, they get the opportunity to reflect on what is happening which can be compared with being encouraging and supportive (Stables, 1997). The preschool teachers highlighted that their view and knowledge of technology result in them influencing the children's learning negatively by their actions. This leadership behavior is a consequence of the teachers' self-expressed limited knowledge of technology, which further influences their inability to answer the children's *why* questions. Enabling learning requires that the preschool teacher to be aware of the goal of an activity. Therefore, they provide planned activities, in which they have control, that open up opportunities for learning in a more profound way than what takes place during unplanned activities.

According to previous research (e.g., Siraj-Blatchford, 2001; Siu & Lam, 2005), preschool teachers should offer children a chance to develop an understanding of the world around them at an early stage. Because young children have an innate curiosity to discover and solve problems, activities involving technology could be welcomed in the preschool environment. This would require that the preschool teachers capture such possibilities by gaining knowledge of how a preschool environment can be equipped to encourage and develop children's discovery of technology. We have identified that preschool teachers may be prone to compensatory and avoidance approaches. However, in line with Csikszentmihalyi (1990) and Dörnyei and Ushioda (2011), we argue that a problem-solving approach may be fruitful in preschool teachers' leadership behavior toward children and that such an approach can be valuable both in planned and unplanned activities. Such an approach will allow the teachers to pay attention to the technology, thereby making it visible to the children. In turn, this can create opportunities for the teachers to experience and handle situations that motivate learning.

Conclusion

The results highlight the importance of developing preschool teachers' knowledge and understanding of technology, which will also enable them to develop their ability to explain and clarify concepts and various technical phenomena. Moreover, such development will enable the preschool teachers to create learning environments for children in which technology becomes something natural. It will also help the preschool teachers become proficient, for example, in problem solving and asking reflective questions—thus enabling them to adopt a problem-solving approach. The development of possibilities for

children's learning about technology will be affected in both planned activities initiated by teachers and, most importantly, in unplanned activities initiated by the children during free play.

For children's learning, interest, and motivation to be strengthened, it is not sufficient to equip the physical environment of the preschool in such a way that it encourages and develops children's interest in discovering technical phenomena. Preschool teachers need to take advantage of the unplanned experiences and capitalize on teachable moments when any opportunities for instruction present themselves by chance, for example, by reflecting on problem solving with the children. Preschool teachers should exploit children's natural curiosity for learning and their problem-solving approach. In this way, the teachers can support the children in discerning what technology is in everyday situations instead of making technology invisible.

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