

Teaching Environments in Preschool Teaching

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Abstract

This paper analyzes how preschool teachers and caretakers meet the demands for cognitive and creative development of children. Observations of 40 sessions in preschools for 1-5-year-old children, and staff interviews were used. The questions guiding the analysis concern how preschool staff describe the considerations they make when planning, how this is represented in the observed activities, and how the results compare to the school and afterschool material analysis.

Teaching thinking and creativity presupposes that the teacher plans, assesses, chooses activities and tools, and arranges the setting carefully, with focus on fostering children's habits of mind. The contextual and communicational interactions play a vital part of support. Evidence of the anticipated criteria was difficult to ascertain in the observed preschools as well as in the previously observed classrooms and afterschools. All previously found teaching environments were found in the preschool material, with a bulk of the child-investigative teaching environment. This environment is similar to Pramling's description of 'child centered pedagogy'. A few preschool teachers present successful planning models and interactional activities to improve children's thinking and creativity, and was found similar to Pramling's 'development pedagogy'.

Key words: thinking, creativity, cognitive development, planning, preschools.

Introduction

Swedish preschools are attended by 83 percent of children age 1-5 years and 93 percent age 4-5 years (Skolverket, 2015). The preschools are, although subject to parents' choice, since 1996 part of the Swedish school system and guided by a national curriculum, *Lpfö 98* (Skolverket, 2010). The staff is mainly of two categories: preschool teachers with a university degree, and caretakers with a secondary school degree.

Swedish preschools are built on a model internationally referred to as *EDUCARE*, education and caring fused together (OECD, 2006). The transition from the social to the education sector has led to an emphasis on preschools as educational institutions, with a stronger knowledge mission than before. The same tendency can be observed internationally (Persson, 2010). In Sweden the closer relation to school activities has led to ambivalence among preschool staff and administrators. Will there be a "schoolification" of childhood, adults guiding what children shall learn, instead of children playing and exploring?

This paper analyses how preschool teachers and caretakers meet the demands to reach the curricular goals for cognitive and creative development of children. The material was collected in Swedish preschools. Swedish preschools are, in the international and European community, often

held out as a good example of quality (OECD, 2006, Tallberg Broman, 2010). The result will, therefore, no doubt be of interest for all European countries with preschools.

Results from schools and afterschools

The paper is part of a larger study (cf. Pihlgren, 2013a, 2014) including an investigation and analysis of current research literature on how education can meet the demands for cognitive development in schools and preschools, compared with results from observations and teacher interviews¹. The larger study also has investigated how the ways that teachers plan and carry out activities changed after having participated in development programs, and what methods seem to be more effective than others when changing teachers' behavior (Pihlgren, 2015).

Literature on teaching thinking and creativity in school shows the importance of the teacher planning, assessing, choosing activities and tools, and arranging the setting carefully with focus on fostering student's habits of mind (Pihlgren, 2013b). Students should have time to make implicit experiences from a variety of angles, gradually taking them to generalized knowledge by challenging explicit cognitive work, training them in analysis, meta-cognition, and formative assessment (Hattie, 2012, Marton, 2006). Wiggins & McTighe (2011) suggest that learning activities should be designed and planned in a particular order, where the central target areas and how knowledge will be assessed precede the planning of activities to meet the goals. The learning activities should focus on thinking and helping the students to uncover thinking patterns by presenting complex and authentic problems where the answer is not self-evident. Using thinking routines and contextual mediation will help the teacher to promote thinking and creativity.

The results from the previously presented papers, focusing on school teachers and afterschool teachers and caretakers (Pihlgren, 2013a, 2014), show that the grey marked positions (see Table 1) in Bloom's revised taxonomy were met in most of the observed classrooms. Contrary to what Anderson & Krathwohl (2001) state, qualitative differences were found in the taxonomy positions, some being more advanced, at least when it comes to thinking and creative activities in the classroom. Only some school teachers and afterschool teachers reached these higher thinking levels, depending on a productive praxis theory affecting how they taught and planned activities and context.

Though most teachers showed an understanding of what would develop the students cognitively, they lacked the understanding to translate this knowledge into practice. The school teachers tended to plan focusing what should be taught rather than students' cognition. The afterschool teachers tended to plan activities, rather than focusing on either what should be taught or students' cognition. Without understanding the differences, teachers seemed to accept methods and structures mechanically.

Table 1. Frequency of markings for school (within parenthesis) and afterschool activities [within brackets] in positions of Bloom's revised taxonomy in percentage of the total material of marks. The grey areas show the most common positions recorded.

THE KNOWLEDGE DIMENSION	THE COGNITIVE PROCESS DIMENSION					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create

¹ These were recorded at 65 lessons in classrooms with students from grade K-12, in 30 sessions of afterschool activities, and 40 sessions of preschool activities, and 82 sessions during development programs.

A. Factual knowledge	(12) [10]	(11) [8]	(10) [12]	(4) [3]	(4) [3]	(2) [4]
B. Conceptual knowledge	(7) [3]	(6) [>1]	(6) [3]	(2) [1]	(1) [>1]	(0) [0]
C. Procedural knowledge	(8) [15]	(8) [12]	(11) [15]	(2) [1]	(1) [1]	(>1) [4]
D. Meta- cognitive knowledge	(2) [2]	(1) [1]	(1) [1]	(<0) [<0]	(<0) [<0]	(0) [0]

The analysis revealed five teaching environments: the common, the student investigative, the scaffolding, the moralistic, and the laissez-fair teaching environment. Their didactic consequences are displayed in figure 1: Position A. *Didactic position* where the intention is to plan both product and process, B. *Process oriented position*, where the intention is to plan or support the process but not specifically the product, C. *Maturity position*, where the outcome, product, is planned, but not the process, and D. *Chaotic/creative position*, where neither is planned by the teacher. The five teaching environments will be presented more closely in ‘Theoretical base’ below.

Specific methods, e.g. thematic subject integration, didn’t automatically lead to cognitive effects. Depending on how they were structured, they gave different cognitive results. Changing between the different didactic positions A, B, C, and occasionally D, in figure 1, interacting between planning either the product or the process or both, seems to promote the desired process. The students here addressed situations where they were to reach a specific goal, where they could explore their own goal, where the method was specified, and where they could choose their own method.

		Teacher's intention of <i>what the student learns</i> , product intention	
		Strong product intention	Weak product intention
Teacher's intention of <i>how the student learns</i> , process intention	Strong process intention	<p>A. DIDACTIC POSITION</p> <p>The teacher introduces new knowledge and generalizations</p> <p>The common teaching style The scaffolding teaching style</p>	<p>B. PROCESS ORIENTED POSITION</p> <p>The teacher supports the process but doesn't guide the outcome</p> <p>The student investigative teaching style The scaffolding teaching style</p>
	Weak process intention	<p>C. MATURITY POSITION</p> <p>The teacher (or the group) decides the outcome but not how it is reached and/or the teacher guides the product through material and context</p> <p>The common teaching style The student investigative teaching style The scaffolding teaching style</p>	<p>D. CHAOTIC/ CREATIVE POSITION</p> <p>The student learns or not on his/her own</p> <p>The student investigative teaching style The scaffolding teaching style The 'moralistic' teaching style</p>

Figure 1. Didactic analysis of five different educational planning styles.

Aim, questions, theoretical base, and method

The questions guiding this analysis have been:

- *How do the preschool teachers and caretakers describe the considerations they make when planning and how are these represented in the observed preschool activities, and more closely in circle-time and the hallway situation?*
- *What differences (if any) can be found when comparing these results to the analyzed school and afterschool teachers, and to research literature?*

Theoretical base

All teachers act in their everyday practice from a more or less explicit pedagogical 'praxis theory' (Lauvås & Handal, 2001, Pihlgren, 2013b). This is often a concoction of their practical experiences, teacher training, examples from others, and in time expertise. At least three main groups of theories affect practice in today's teaching (Pihlgren, 2011): the behaviorist, the maturity, and the interactive². The interactive theory (cf. the tradition of Vygotsky) and the maturity theory (cf. Fröbel, Montessori, Steiner) see the learner as active, as opposed to the behaviorist view that individuals will learn when tempted by rewards or in fear of punishment (cf. Pavlov, Skinner). In the behaviorist tradition, learning and maturing are more or less considered to be the same process (Carlgrén, 1999).

² This is a merge and a deliberate simplification of several different theoretical perspectives. Håkansson & Sundberg (2012) states that four perspectives have influenced the western world educational research the last century and practice: behaviorism, cognitivism, pragmatism and socio-cultural perspective. The praxis theories, as I describe them, are focused on how educators have interpreted the perspectives in their practice – cognitivism is the foundation of maturity theory, and pragmatism and socio-cultural perspective are the foundations of interactive theory.

In the maturity tradition learning is taking place as an effect of the learner maturing. In the interactive theory base, the child will learn in interaction and thereby mature and develop.

Previous analysis (Pihlgren, 2013a, 2014) showed that depending on how theories were interpreted they either supported the teacher's intentions to teach students to think, or not. Five teaching environments were found:

The *common teaching environment* means controlling the content of what is to be learned by planning the student process closely, by using several different tasks and methods, most commonly lecturing (position A in figure 1). During group discussion, task, and home assignment, the choice of process is up to the students (C). The knowledge and cognitive processes initiated are concentrated within the grey area of Bloom's taxonomy (table 1). The dialogue is controlled by the teacher, and questions are focused on evaluating the students' knowledge. This plan is closely related to behaviorist theories (cf. Hunter, M. *Instructional Theory in Practice*).

The *student-/child-investigative teaching environment* is more common in classes for younger children, or in practical-aesthetic subjects. The activity starts in position C by introducing new material that will help the students to develop. The activities continue there, or go on to position D - the students explore their own areas of interest in whatever way they choose. The students have time to apply and create factual and procedural knowledge, but analyzing, evaluating, or meta-cognitive reflection are not addressed. The environment is related to theories about learning as maturity.

The *scaffolding teaching environment* was observed with a small group of teachers, planning what was to be taught and how in ways leading to higher order thinking in class. Analytic, evaluating, and meta-cognitive questions and analysis addressed position B, guided experiments and tasks addressed position C, lectures A, and exploratory and creative elements D. This environment addressed more cognitive and knowledge targets than any of the other planning environments, and is connected to interactive theories.

The *'moralistic' teaching environment* was observed in some of the activities and lessons, or parts of lessons, facing position D: neither the product nor the process seemed planned towards a cognitive goal. The teacher seemed occupied with something else, presumably teaching the students how to behave.

The *laissez-fair teaching environment* was not observed in classrooms but in afterschool activities. Here the staff seems to lack pedagogical intention, didactically almost solely ending up in square D in figure 1. The *laissez-fair environment* seems to leave the decisions to the student.

Methods

Observations for 1-3 hours and one-hour individual staff interviews were recorded during three years in five preschools with 40 sessions of preschool activities for children 1-5 years old. The observations included preschool teachers and caretakers. In interviews feedback on the observation notes was given and discussed. Written notes on these discussions were recorded during and after the meetings.

Observation notes were taken using a chart where every new sequence in the observed activity was recorded, stating time, actions, and observed outcomes. Contextual information was noted. Bloom's

revised taxonomy for learning, teaching, and assessing (Anderson & Krathwohl, 2001) was used, both as an observational tool, and when coding and analyzing data. In contrast to Bloom's (1956) classic 'Taxonomy of Educational Objectives' the revised taxonomy analyzes the content from two dimensions: a *knowledge dimension*, and a *cognitive process dimension*, see table 1.

A phenomenological approach, using Eisner's (1991) 'educational connoisseurship' and 'educational criticism' was used (also cf. Pihlgren, 2008). Knowing the area under investigation thoroughly allows the researcher to sense the important nuances and features, and this is combined with a critical approach where the findings are assessed. Eisner (1991) identifies some important dimensions in this work: describing the events or findings so that the reader can visualize and experience them, interpreting the events or findings so that they are decoded as to why and how they occur, evaluating them as to how they contribute to educational value, and finally formulating themes and dominant features, by identifying the recurrent messages. Thus conclusions are made from a qualitative, inductive analysis of the effects, trying to find clusters of reoccurring actions and reactions (Patton 1990).

The sequences chosen show some sort of critical event or action. Critical events, and if taken actions are successful or not, will reveal vital information of what is important in a situation (Dascal 1985, Maracondes, 1985). It will make the implicit rules of the social "game" explicit (Koschmann et al. 1998). The cognitive content in each sequence was assessed and coded as to what cognitive and knowledge dimension it addressed. The results of this categorization for each teacher were compared to the teaching environments, using the interview material to match each teacher's praxis theory and the teaching environment exposed. The result was then analyzed from criteria from the literature section and conclusions were made about consequences of teacher praxis theory on planning and teaching actions, and structure, control, and intellectual challenge. This was then compared to the results from analyses of school teachers and afterschool teachers. Some activities were more frequent in the observations. Of these, circle-time activities and the hallway situation has been subject to closer result presentation, representing activities where teaching or caretaking traditionally is more focused.

All staff members consented to participate and could at any time refrain from participation. In this paper, all names of individuals and preschools have been changed to guarantee anonymity.

The work was limited to the staff's choices, not investigating the cognitive processes within each child. The analysis was limited as to how the preschool staff met the curricular demands for cognitive and creative development. Other curricular goals were not analyzed.

Marking the taxonomy meant making choices and interpretations (cf. Green et al. 2003, Rostvall & West, 2003, Skukauskaite, 2012). Important material might have been lost. All the same, interesting results have been highlighted. The participating staff were aware that the observations were evaluative. Keeping this in mind, the result will probably show what they were capable of doing at best. There was an overweight of female teachers participating. One explanation for this is probably the low representation of men teaching in especially the lower grades. However, Einarsson (2003) found no significant effect of the sex of the teacher on interaction in the classroom. The result cannot presume to be valid in all preschools but points to important trends to investigate further.

Literature

Theoretical Swedish preschool literature often put forward the idea that preschools could be a place for children's production of knowledge and the child's personal understanding of the world (cf. Dahlberg, Moss & Pence, 2003), stressing the child as an exploring and creating being (Dahlbeck & Persson, 2010). However, preschool teachers interpret their mission in many different ways (Håkansson & Sundberg, 2012). Pramling Samuelsson (2011) makes a difference between what she calls 'child centered pedagogy', concentrating on the child and its interest at a particular time, and 'development pedagogy'³, where the preschool staff attempts actions or situations that will develop the child's understanding in some way. There is also a third approach, where the adult is active and dominates and structures the activities (Pramling, 1994).

The development pedagogy preschool teachers interact with the child "here and now" but at the same time target what knowledge and understanding the child should be able to develop. They are knowledgeable in the addressed teaching areas, and are skilled in challenging dialogues with children. They work in the intersection between the learning object (what is to be learnt) and the thoughts, ideas and questions of the child, also using the authentic situations in preschool to teach: laying the table, dressing, and circle-time. Meta-cognitive thinking and reasoning, helping children to express and think about how they think, solve problems, and develop ideas is equally important. These preschool teachers are shown by previous studies to display high quality work (Pramling Samuelsson, 2011).

Development pedagogy is closely related to variance theory (Pramling Samuelsson, 2011). However, there are differences between how variance theory is used in school, where the learning object is presented from varied angles, and actions are used to make the student understand in a certain way. In 'development pedagogy' variance is used as a variety of different ways to understand and represent a learning object.

Planning for learning in preschool

Close to the idea of development pedagogy is the socio-constructivist ideas represented in the preschools in Reggio Emilia (Persson, 2008). Reggio Emilia preschools have worked together with researchers in Harvard Project Zero to investigate teaching of thinking in preschools (Project Zero & Reggio Children, 2001). The staff design and construct the context to enhance important learning processes in the group of children, and assure that children can form relationships, cooperate in learning, and learn competences (Filippini, & Giudici, 2001). The staff uses the following plan when starting a project (Vecchi, 2001):

1. Initial delimitation of the field of investigation and identification of the theme to be proposed to the children:
 - a. Identification of a meaningful context within which to place the project.
 - b. Initial questions to be considered regarding the identified theme.
2. Preliminary lines of observations related to the children's verbal hypothesis:
 - a. Identifying the means to use in the theme.
 - b. Identifying the method to use.

³ Pramling Samuelsson uses the Swedish terms *barncentrerad pedagogic*, here translated to child centered pedagogy, and *utvecklingspedagogik*, here translated to development pedagogy.

3. Self-assessment and assessment.

The Reggio Emilia staff makes a distinction between planning in 'programs', where subjects are planned in a particular order and is led and assessed by an adult, and the Reggio Emilia approach of planning in 'projects' where children's different theses, thoughts and theories are tested within a project (Vecchi, 2014). However, it's important to realize that knowledge shouldn't be separated in reproducing and producing, all learning contains both aspects (Dahlbeck & Persson, 2010). The teaching should be a responsive listening and a challenging of ideas (Barsotti, 2001, Mardell, 2001, Project Zero & Reggio Children, 2001).

To document for development

There has been scarce Swedish research done on assessment in preschools (Vallberg Roth & Månsson, 2010). One of the reasons might be that the curriculum (Skolverket, 2010) indicates that Swedish preschools should assess how the staff reaches the stipulated goals, and not the individual results of the child. This kind of assessment is closely connected to pedagogic documentation used to track the thinking and development of the group of children in order to meet with the interest of the group and challenge them to new explorations and further thinking (Rinaldi, 2001, Seidel, 2001).

Pedagogical documentation has been developed by the Reggio Emilia preschools and is used to assess how the group is taking on what the pedagogues have presented, how they think, and how this is made visible. The documentation is analyzed and used to make new decisions about how to go on. This is done in the group of staff and, when children are older, together with them. However, the staff are making choices of what and how to observe and document, how to challenge the children to further thinking, and which of the ideas might be picked up (*Pedagogiska magasinet*, 2016).

The pedagogical dialogue

The contextual and communicational interactions play a vital part of support for learning (Jensen, 2011). The ideal pedagogical dialogue is an activity directed towards discovery, new understanding, and learning, and is held in a non-authoritarian fashion, with many participators (Burbules, 1993; Dysthe, 1996). Open ended questions are particularly important when fostering intellectual abilities and will also promote social development (Billings & Pihlgren, 2009, Pihlgren, 2008).

Lindahl (2002) showed that preschool staff used different dialogic strategies when supporting children's problem solving (Lindahl, 2002). Some used a *creative dialogue*, helping the child by open questions and an exchange of ideas to articulate the problems and solve them. Another approach was the *reproductive dialogue*, where the staff would ask children questions to control their knowledge. This question-answer-pattern interrupted the children and led to less problem solving and more imitation. In the third, *instrumental dialogue*, the staff asked children questions to control their attentiveness. The children followed instructions, but also chose to take their own ways.

Research on circle-time and hallway activities

Circle-time and the hallway situation are common activities in Swedish preschools, and traditionally represent two endpoints on a scale in the EDUCARE concept, from either focusing teaching (circle-time), to having caretaking in focus (the hallway situation). Tallberg Broman (*Pedagogiska magasinet*, 2015) points out that preschool pedagogy research has dealt with other areas than teaching and didactics. The focus has rather been on important conditions to promote younger children's learning

(Håkansson & Sundberg, 2012, Persson, 2008). This lack of studies on preschool teaching and didactics is to some extent mirrored in the following text.

Circle-time

Circle-time stems from the tradition of Friedrich Froebel (1903) who meant that the child should experience a connection to the universe, specifically when together forming a circle, the symbol of wholeness and eternity. Davidsson (2000) points out that one of the goals of circle-time is to prepare the child for school, and it's considered more 'school like' than other activities in preschool. The circle-time has historically been a means to foster children socially, to speak in a group, to sit still, and to listen to others (Rubinstein Reich, 1996).

Haglund (2004) showed that circle-time in afterschools in reality could expose very differing goals and outcomes but according to Granberg (1999) the circle-time is performed very much in the same fashion in all preschools: children and staff sit at the floor in a circle, the session is led by one of the staff, at the same place and time every day usually before lunch, and it lasts 15-20 minutes. Circle-time has been criticized for being controlled by adults and giving little time for children's participation and empowerment (Eide, Os & Pramling Samuelsson, 2012).

The hallway

The hallway is the context for passing in and out of preschool and holds several routine caretaking situations (Johansson, 2003). Even though the preschool staff wants to establish a warm and close relationship to each child, they often complain that structures will make this difficult (Linnér, 2005). The Swedish Schools Inspectorate (Skolinspektionen, 2016) showed that most preschools took care of children in a supportive, safe, and positive way. However, every fifth preschool did not. The staff would take on a passively monitoring attitude, and in some cases admonishing and reprimanding the children (also cf. Johansson, 2005). The bigger the groups were, the less attention towards the children. Children were expected to do the same thing and be at the same place and time. In half of the studied preschools the hallway situations weren't used as or considered a learning environment.

Other preschools used the caretaking situations to create and maintain good relations, and as learning situations, using dialogue (also cf. Johansson, 2005). The staff organized the activities in smaller groups, making it possible to catch an occurring learning situation.

Results

Overall in the preschool observations, 555 sequences were noted, resulting in more than 5 500 marks in Bloom's revised taxonomy (cf. Anderson & Krathwohl, 2001). Table 2 shows the percentage of markings made in the total material of marks.

Table 3. Frequency of markings for preschool teachers and caretakers in positions of Bloom's revised taxonomy in percentage of the total material of marks. The school (within parenthesis) and afterschool results [within brackets] are included for comparison.

THE KNOWLEDGE DIMENSION	THE COGNITIVE PROCESS DIMENSION					
	1. Remember	2. Understand	3. Apply	4. Analyze	5. Evaluate	6. Create
A. Factual knowledge	11 (12) [10]	9 (11) [8]	12 (10) [12]	2 (4) [3]	3 (4) [3]	5 (2) [4]

B. Conceptual knowledge	4 (7) [3]	2 (6) [>1]	5 (6) [3]	1 (2) [1]	1 (>1) [>1]	>1 (0) [0]
C. Procedural knowledge	14 (8) [15]	10 (8) [12]	15 (11) [15]	2 (2) [1]	1 (1) [1]	3 (>1) [4]
D. Meta- cognitive knowledge	2 (2) [2]	1 (1) [1]	>1 (1) [1]	<0 (<0) [<0]	<0 (<0) [<0]	0 (0) [0]

Remember, understand, and apply factual and procedural knowledge were the most frequent activities, with a stress on procedural knowledge. These six dark grey marked positions were activated in a majority of the 40 observations. Some differences compared to the school observations (within parenthesis in table 2) can be seen: the preschool as well as the afterschool staff (within brackets in table 2) stress procedural knowledge, and creative approaches are more common than in the school context. There seems to be a higher emphasis on children “doing” rather than children “thinking” as this example shows:

Excerpt 1⁴. Preschool teacher Kalle introduces things that roll to children age 1-3 at the Stationmaster preschool.

The younger children have shown an interest in pinecones rolling. Preschool teacher Kalle has brought a box of pinecones into the circle-time, for the children to roll down a board leaning against a stool. After a while Moa spots the box of pinecones and shakes it, causing a rattling noise. Several children find an interest in what Moa is doing. Kalle brings more boxes and more children take the opportunity to try and make sounds.

Kalle’s actions will hit the dark grey marked areas in the taxonomy, figure 2. The children are given the opportunity to try out their own interests but the preschool teacher doesn’t try to enhance or develop their further thinking on the subject, with the result that children go on practicing things they already know or master, sometimes catching up on a new idea by watching the other children. The atmosphere is allowing. There is not much dialogue, no concepts are introduced or discussed, and the discourse mostly concerns what the children would like to do.

All five previously found teaching environments were found in the preschool material. No additional environments were found. The child investigative environment was the most common environment observed in the preschool material (cf. preschool teacher Kalle in excerpt 1): The staff presents some material that the children can explore on their own. One difference to the school and afterschool teachers and caretakers planning for this environment could be noted. In half of the material the activities sprung from some sort of documented observation, where the teacher or caretaker had documented the children in play or activity to investigate what interested the children at this point. In interviews this group of staff referred to being inspired by the pedagogic ideas of Reggio Emilia.

Another group of teachers, showing a different practice, also often referred in the interviews to Reggio Emilia pedagogy as an inspiration. At a co-planning unit in the same preschool as Karl in excerpt 1, the Stationmaster, preschool teacher Stina works, displaying a scaffolding teaching environment:

⁴ The excerpts have been shortened and/or summarized to facilitate the reader’s understanding. They are translations from the Swedish original field notes.

Excerpt 2. *Preschool teacher Stina introduces things that roll to children age 1-3 at the Stationmaster preschool.*

Stina has observed that the younger children show an interest in things that roll. She has introduced a tilted board where the children roll balls. After a while Stina takes out some additional objects: building blocks, plastic animals, wheels, and cars.

Stina: Can you roll these too? /The children try, some things roll, others shuffle, some don't move. Kim pushes one of the animals and it rumbles down the board. Other children imitate/

Stina: How can we get them to move without pushing them? Could we raise the board?

Now most objects move. Stina keeps asking questions and with the children changes the conditions like putting obstacles in the way and observing when objects will stop, or adding a plastic sheet to the board. Stina documents every new step with a camera. After a while she asks the children to sort the used objects in three piles: those rolling, shuffling, and not moving by themselves. The piles are photographed.

Preschool teachers planning for the scaffolding teaching environment often start by the children investigating something, often puzzling (e.g. rolling the objects). The preschool teacher then helps the children to systemize what they learnt (e.g. the sorting in piles), and will go on to systematically enhance the children's understanding of the explored phenomena. In Stina's case she explains that she is aiming at enhancing the children's understanding of physical inertia, and how objects in motion are affected by applied forces. The scaffolding preschool teachers use meta-cognitive questions to invite the children to think, resulting in higher cognitive levels. Stina's interaction with the group hits almost all dimensions in the taxonomy (figure 2) during the observed sequence.

Circle time

The common teaching environment was not as frequent in the preschool material as in the school observations, but were more frequently observed at activities that might be seen as connected to traditional teaching areas – reading aloud, excursions, and circle-time:

Excerpt 3. *Preschool teacher Ove and caretaker Bellita in circle-time with children age 1-5 at the Cornflower preschool.*

The children are seated in a circle on a round rug. They have just finished singing a song together with preschool teacher Ove and caretaker Bellita. They applaud and smile.

Bellita: It's your choice now, Love /Love moves and looks hesitatingly up at her/ Don't you know what to choose? Do you want to pick one from the tin? /Love nods and Bellita hands over the tin/ Please take out a note, Love /Love bends down, picks a note/ It's 'Little snail'! /Bellita applauds. The children start to applaud. Love smiles and applauds/.

The circle-time continues with Ove teaching the children a new song. Afterwards a new note is added to the tin.

The Cornflower circle-time has a structure, well-known to the children. It invites the children to participate in the singing and applauding together. Language is trained through the adults' description of what is happening and their support to children to participate. Both caretaking and teaching are in focus. Bellita and Ove creates harmony and safety and the children are invited to participate, even though the adults control both structure and content. The teaching environment is child-investigative with segments of the common teaching environment. Preschool staff that plan for the common teaching environment will plan and carry out the activity by introducing new knowledge early in the process, go on to let the children practice the new knowledge, and control that they understand by observing and asking control questions, as in this example from the Painter preschool circle-time:

Excerpt 4. *Preschool teacher Nell and caretaker Lise in circle-time with children age 4-5 at the Painter preschool.*

The children are seated in a circle together with preschool teacher Nell and caretaker Lise. Nell has a bowl of soap-water and one at the time the children are asked to blow bubbles.

Otto: I wanna, I wanna /waves his hand/

Nell: Hush, it will be your turn soon. Anja! /Anja smiles and reaches for the bowl, blows some bubbles/

Anja: Mia! /Mia jumps up and pops as many bubbles as she can. The others applaud/

Nell: Elis! /Elis blows bubbles with some difficulty and chooses Marco as "bubble-popper".

Otto: Boring /sighs. Lise puts her hand on his leg/

Nell: Ali. /Ali blows bubbles and then chooses Otto as the popper. Otto jumps off the chair and pops as quickly as he can, eventually falling to the floor. Children laugh and applaud and Otto makes some extra turns on the floor.

Nell: Sit down Otto. It's time to finish the bubbles to have a snack. Don't forget to put the chairs in their place.

Nell is teaching the children turn-taking and waiting their turn, something Otto finds hard. The common teaching environment will address remember, understand, and apply factual, conceptual, and procedural knowledge in the taxonomy, a larger area than the child-investigative environments, but not as large as the scaffolding teaching environment. The praxis theory is connected to behaviorism but shows elements of maturity theory in some preschool observations (e.g. excerpt 3).

The moralistic teaching environment also was observed on some occasions, like in this example:

Excerpt 5. Preschool teacher Lena and caretaker Elise in circle-time with children age 3-5 at the Moon preschool.

The children are sitting in a circle together with Lena and Elise. It's Monday morning and the circle-time has gone on for 15 minutes.

Lena: What did you do this weekend, Tuva? /Albin lies down on the rug/

Elise: Albin /Albin sighs and sits up/

Tuva: I was at my grandmother's. She has a cat /smiles/

Katja: My granny has a cat! /Smiles at Tuva and then at Ninni, who is seated beside her. They move closer together/

Lena: Katja, it wasn't you who was telling now. Do you want to tell us something more, Tuva? /Tuva shakes her head. Albin sighs and starts pressing his foot against the leg of Tage. Tage tries to push the foot away/

Elise: Albin, did you hear what Tuva said? /Albin draws back his foot/

Lena: Arman, what did you do this weekend? /Arman shakes his head. Lena looks in Katja's and Ninni's direction. The girls are giggling and hugging/ Sit properly on the rug, or I'll have to reseat you. /Lena turns back to Arman, who is looking down at the rug/

Albin's name is used six times in the 20 observed minutes to reprove his behavior. Katja and Ninni are also reprimanded a couple of times.

As in the Cornflower circle-time, this circle-time is planned and led by the adults. However, it differs on some significant respects. Some of the children choose not to participate in the activities. Albin protests visibly, and seems to find the content uninteresting, maybe because the choice of subject. Some children might feel uneasy having to tell about their weekend. Moreover, it's relatively uninteresting to the others. Katja and Ninni are forming a unit that doesn't take part in the common activity. This is probably reinforced by Lena reprimanding Katja, even though Katja was actually supporting what Tuva had said (e.g. "My granny has a cat!"). Arman shows anxiety – the circle-time is, mainly because of the adult actions, not a safe enough place for him to want to participate.

The observed preschool activities displaying this moralistic teaching environment hit very few and random areas of the taxonomy, not much cognition is addressed, at least not when comparing to what is intended in the curriculum. The adult will often use questions as means to tell children that they are misbehaving or not attentive (e.g. "Albin, did you hear what Tuva said?").

No organized circle-time activities displayed the laissez-fair teaching environment. However, this environment was observed during what was organized as "free play", where the children would play, indoors or outdoors, and where the staff didn't take any visible part of what was going on unless some child cried or got into conflict. In a few cases, the scaffolding teaching environment was observed during circle time:

Excerpt 6. Preschool teacher Bente in circle-time with children age 4-5 at the Daisy preschool.

The children are seated in a semi-circle in front of a flip-chart, leaning against the wall. Preschool teacher Bente is prepared to write down what the children remembers from today's activities. After writing, the flip-chart is positioned in the hallway for the parents to read.

Bente: Who wants to start? What did we do today? /*She looks around*/

Bo: We did mud!

Bente: Yeah, what's it called, do you remember? /*Nobody answers*/ Quagmire /*writes on the flip-chart while she pronounces the sounds*/ W-e d-i-d... do you want it to say quagmire? /*turns to Bo who nods*/ ... q-u-a-g-m-i-r-e s-a-i-d B-o.

Rut: I was angry at Elin because she took my whisk.

Bente: How did you solve that?

Elin: We told Miss to get another whisk.

Bente: Are there some other ideas on how such a problem could be solved? /*looks around the group*/

Some children present ideas that are discussed for 5 minutes and after a while Bente writes two sentences chosen by Elin and Rut: "I was angry at Elin because she took my whisk, said Rut" and "Then I got my own whisk, said Elin".

Here circle-time is based on the every-day events happening in the preschool group. The preschool teacher guides the process but the content is created in cooperation with the group. The preschool teacher supports the children's' interplay by asking open-ended questions and encourage the participants' problem-solving and suggestions. Rut and Elin seem to find the group climate safe enough to raise something that had affected them negatively. Preschool teacher Bente partly aims at teaching the children the foundations of writing, but she has some superior goals: Like in the Cornflower circle-time (excerpt 3) the aim is to create a community, but in Bente's case it's a community of learners that is intended, giving the participating children power, mandate, and responsibility.

The hallway

In some activities, like eating, dressing, and transporting, caretaking was more in focus. Most of the hallway situations observed were dressing or undressing connected to outdoor activities, and most of these situations were regarded by the staff as a passage towards an activity, a sort of limbo to pass before getting on with whatever was planned. In many cases the whole group (20-25 children and 5-6 staff) were present in the hallway, resulting in more or less turbulent scenes:

Excerpt 7. Staff and children age 1-5 at the Ladybug preschool dress before outdoor activity.

Preschool teacher Ylva is helping two of the youngest children to dress, Emmy and Frans. The children are getting dressed in overalls, boots, mittens, scarfs, and headgear. Caretakers Jonas, Linda, Kay, and Camilla are helping some of the other 19 children to dress. They are all in the hallway.

Ylva: /*to Jonas*/ Will you dress Kent? I think Matilda can cope on her own/*Jonas turns from Matilda to Kent and starts helping him to put on the overall. Ninni and Jessica, two five year olds, are playing with Ninni's scarf, having a tug of war, giggling*/

Camilla: /*to Ninni and Jessica, while dressing Oscar*/ Stop fussing and get on with your dressing girls, we have to hurry now to get to the park /*the girls look quickly at her and start dressing*/

Nils: Aohh /*cries out loudly. Ylva looks up, leaves Emmy, and moves across the room towards Nils*/

Ylva: /*to Kay, standing close*/ Oh no, she's bit him /*turning to two-year-old Freja*/ You shouldn't bite, you know that!

Freja: /*starts crying*/

Ylva /*to Nils*/ It's not so bad, let me blow on it. There, it's all right /*turning to Freja*/ Come on, let's get you dressed.

After 17 minutes all the children are dressed and lined up outside, the youngest in prams, and staff distributed along the line, setting off towards the park.

This hallway environment is noisy and hard to overlook. The staff seems tense and are trying to get all the children dressed as quickly as possible to have time to go to the park before lunch. They tend to talk to each other, commenting on the children and what to do, rather than talking to them. They are depending on the older ones to dress themselves, but not inviting them to participate or help each other dressing. It's a hazardous milieu, where play or accidental pushes easily might turn into conflicts. The teaching environment is laissez-fair (with elements of moralistic and child-investigative) – the actions in the hallway have no planned cognitive content, and is not good caretaking.

There were also a few observations of hallway environments that could be categorized as common, as in the Painter preschool hallway:

Excerpt 8. *Staff and children age 4-5 at the Painter preschool dress before outdoor activity.*

The group of 10 children are dressing with preschool teacher Annie and caretaker Bengt in the hallway.

Annie: Let's all sing a song together! Which one shall we choose?

Tom: We walk!

They start singing: We walk and walk and walk...

The singing continues during the dressing activity, taking 10 minutes.

The singing is used as a way to practice their song repertoire but also as a way to distract and encourage the children during the dressing. Like the situation in excerpt 8, most of the observed hallway situations were positioned somewhere between the turbulent Ladybug hallway and good caretaking merged with teaching, as in this hallway at Cornflower preschool:

Excerpt 9. *Staff and children age 1-3 at the Cornflower preschool dress before outdoor activity.*

Caretaker Gunilla has put out the younger children's clothes on the floor in the order they will have to be put on: socks, scarfs, overalls, boots, mittens, and headgear. The children move towards their row of clothes and start to dress while Gunilla is helping the youngest, Ali.

Gunilla: Now where do we start?

Afsun: Socks! /holds up her socks and smiles/

Gunilla: Right, get you socks on. Well done Ängla! Are you getting them on Klas? Good! There you go Ali, you're ready now! /sits him on the floor and moves on to help Ängla/ You really got those socks on quickly, do you want me to help you with the overall?

Ängla: Mm

Gunilla: Who else needs help? Are you all set Afsun? Maybe you could help Klas with his zipper? Do you want some help, Klas?

They dress for 9 minutes while Gunilla and Afsun talk and the other participate by exclamations.

The Cornflower staff group and their preschool director have specified a set of routine procedures, like the dressing situation, used by all staff members. The aim is to assure that the children can learn within the situation. Putting the clothes in a row is a way of visualizing to the children a system for getting dressed that they later can make use themselves. The established routines help Gunilla to create a scaffolding teaching environment.

The Cornflower preschool also use an organization where one staff member takes care of a smaller group of children during most of the day, and especially at the activities where the caretaking aspects are essential (like eating, dressing, and transporting). Compared to the Ladybug hallway, this observation shows a calm and caretaking situation, where the atmosphere is helping and cooperating. However, a small group isn't a guarantee for qualitative caretaking, as this observation shows:

Excerpt 10. *Preschool teacher Madde and two children age 2 at the Moon preschool dress before outdoor activity.*

Preschool teacher Madde and the two year olds Fredrik and Li are in the hallway, dressing to go out, trying to find their clothes in the boxes with their nametags on.

Madde /looking down into Li's box/: But, didn't your mother bring you any mittens?

Madde seems to be talking to herself, not considering that the children are present. However, her comment is heard by both Li and Fredrik, and will be hard for them to interpret.

There are very few examples of notes in the meta-cognitive knowledge dimension, and exceptionally few in analyze, evaluate, and create meta-cognitively, all notes there were taken in seven of the 40 observations, mostly with preschool teachers (cf. excerpt 2, 6). Generally, there is a quality difference

in the material when the sessions are led by a preschool teacher, where more cognitive and knowledge dimensions are hit, compared to sessions led by caretakers⁵. Preschool teachers could express the knowledge they had aimed at, even though the actual outcome often targeted more or other aspects too. Many caretakers had difficulties to explain what they had aimed at and their sessions often displayed different knowledge aspects than they stated. Most of the staff had difficulties when trying to explain what cognitive processes they had planned, even when helped by the taxonomy and the interviewer.

Conclusions

Literature on teaching thinking and creativity in school show the importance of the teacher planning, assessing, choosing activities and tools, and arranging the setting carefully, with focus on fostering student's habits of mind (cf. Pihlgren, 2013b, Wiggins & McTighe, 2006). Students should have time to make implicit experiences from a variety of angles, gradually taking them to generalized knowledge by challenging cognitive work (cf. Hattie, 2012, Marton, 2006). This is also shown in preschool research (cf. Pramling Samuelsson, 2011, Project Zero & Reggio Children, 2001). Pramling Samuelsson (2011) identifies this approach as 'development pedagogy'. However, there are differences in the way preschool activities are supposed to be performed, compared to school activities, with a greater openness towards the different understandings and interpretations of the child.

Preschool results compared to results from schools and afterschools

One of the research questions concerned the differences that could be identified when comparing the preschool result with the previously presented results from schools and afterschools (cf. Pihlgren, 2013a, 2014, 2015). Evidence of the anticipated criteria for enhancing thinking and creativity was difficult to ascertain in all three systems. Most school teachers taught the basic levels of knowledge and cognition. In afterschool this was less frequent, the students were to a higher extent left to find their own activities. In preschools, there was a strong tendency towards letting the children's experiment guide the content, showing markings in Bloom's taxonomy with a similar pattern as the afterschool activities.

Some teachers in all systems presented successful models to address and challenge children's and students' higher cognitive levels. Their work showed similar patterns to what Pramling (2011) describes as 'development pedagogy'. Depending on how theories were interpreted by the preschool teachers they either supported the preschool teacher's intentions to teach children or students to think, or not. All five teaching environments were found in the preschool material, with a bulk of the child-investigative teaching environment. This environment is similar to Pramling's description of 'child centered pedagogy'. The common teaching environment was far less frequent in preschools than in schools. However, in circle-time it appeared quite frequently. Here, the preschool teacher dominated and structured the activities to a higher extent than, for example, in aesthetic activities (cf. Eide, Os & Pramling Samuelsson, 2012, Davidsson, 2000, Rubenstein Reich, 1996).

⁵ The results from previous parts of the larger study show that both caretakers and preschool teachers were able to improve their teaching from certain development programs (Pihlgren, 2015).

Education and caretaking

The differences between frequencies of teaching environments in certain activities were overall larger than in the school results. Activities traditionally connected to teaching – circle-time, reading aloud, and excursions – often displayed a common teaching or the moralistic environment. In figure 1, this would mean taking on a didactic position (A) with some elements of the maturity position (C). The reproductive and the instrumental dialogue types found by Lindahl (2002) were dominant, leading to less problem solving. Sometimes the relational aspects were tended to and sometimes not. While the Cornflower circle-time (excerpt 3) is supportive and inviting, the Moon's (excerpt 5) is excluding some children. The main aim of this circle-time seems to be to teach the children to sit still and wait for the adult to give them an assignment. Interaction between the children is considered a disruption or a sidetrack.

Activities traditionally regarded as caretaking (Johansson, 2003) – eating, dressing, and transporting – more often displayed the moralistic, or laissez-fair teaching environment, with less cognitive content (cf. Linnér, 2005). When analyzing the positions in figure 1, this meant taking on either a maturity position (C) or a chaotic/creative position (D). The instrumental dialogue was more frequent even though the dialogue often was positive and relational (cf. Johansson, 2005, Skolinspektionen, 2016). This was often related to how the staff had systemized the routines. In Ladybug preschool (excerpt 7) the crowded hallway caused an unsafe environment. However, small groups were not in itself a guarantee for good caretaking. The dialogue in the small group of the Moon hallway (excerpt 10) and in the big group of the Ladybug hallway situation (sequence 7) show adults talking 'over the head' of children, with weak or no comprehension of what cognitive outcome the situation will result in, nor any thought of what is to be accomplished. The staff in these preschools seemed to think in dichotomies such as education and caretaking, connecting education to traditional school activities and seeing caretaking as transportation time to the "real" activity. If school is seen as what is performed in a common teaching environment, this reasoning might be a part of the fear of "schoolification" (cf. Persson, 2010).

In some preschools, the staff was able to merge learning and caretaking to something intended in the EDUCARE concept (cf. Johansson, 2005). Here, all activities might be used to create learning situations. In the Cornflower hallway (excerpts 9) the children dressed in smaller groups, which probably led to a controlled situation. However, the Cornflower staff also had specified a set of routine procedures used by all staff members, and based on pedagogical ideas, probably accounting for the higher cognitive quality. At the circle-time of Daisy (excerpt 6) the children were invited as collaborators, and the cognitive outcome is high.

Describing their planning and assessing

When the preschool teacher used documentation as a way of tracking the interests/understanding of the children they often used circle-time in a more untraditional way, not as an activity systemized the same way at the same time of day (cf. Granberg, 1999), but changing, depending on what the group wanted or needed to explore, as shown in both Stationmaster excerpts (1, 2). Some of these merged activities showed a high cognitive content, and a scaffolding teaching environment (cf. excerpt 2). These preschool teachers used more open-ended questions and a creative dialogue (Burbules, 1983, Dysthe, 1996, Lindahl, 2002), resulting in children's thinking and problem solving (cf. Billings & Pihlgren, 2009, Pihlgren, 2008). However, in most of the observed activities, preschool staff took on

the maturity position (C), creating a child-investigative environment with lower cognitive content (cf. excerpt 1).

The preschool teachers and caretakers described their considerations when planning and assessing in fairly similar ways, even though they might create different teaching environments in observation. Kalle and Stina at Stationmaster preschool exemplify the two groups of the interviewed preschool staff that claim to be inspired by Reggio Emilia. They use observation and documentation but, as indicated in excerpt 1 and 2, their aim and the cognitive outcome is very different. Staff, planning for the child-investigative environment, use documentation to find out what material or areas the children are interested in and how this interest is developed during the activity. This is also done in the scaffolding environment, but the preschool teachers planning for this environment also have a clear idea of what area of knowledge they are targeting. Whereas Kalle has planned some activities that will be changed when the children show interest in something else (e.g. the rattling noise of the box of pinecones), Stina uses her documentation to find out how she will be able to help the children to understand something new. Stina's way of using the documentation as an assessment of what the children have understood and what might be the next challenge to their understanding, is used by the seven preschool staff members creating a scaffolding environment. This way of planning corresponds to the way Reggio Emilia preschools use documentation (Filippini, & Giudici, 2001, Project Zero & Reggio Children, 2001, Rinaldi, 2001, Seidel, 2001, Vecchi, 2001, 2014) and also corresponds to the planning suggestions of Wiggins & McTighe (2011).

To most of the preschool staff members, the important understanding of the differences between the child-investigative teaching environment and the scaffolding environment seem unclear. If there is an ambivalence to school influence (cf. Persson, 2010), this may be interpreted as avoiding the common teaching environment, and this might cause some problems. The child-investigative environment could be perceived as involving a set of actions where the child can learn and develop by exploring and creating, a perception that to some might seem as if it correspond to the theoretical ideas of Swedish preschools (cf. Dahlberg, Moss & Pence, 2003, Dahlbeck & Persson, 2010). Using the term 'documentation' instead of 'assessment' might intend to express a distance towards preschool staff creating a common teaching environment. On the other hand, it will also lead the thought to the documenting activity, observing and writing down what the children do and prefer, rather than the analytical part of the assessing process, where staff record and analyze how they might challenge children's thinking. Staff in the child-investigative environment will use the documentation as an activity, whereas staff in the scaffolding teaching environment will use documentation as a way to understand more about how to facilitate the learning process.

Research on how and if the Swedish ideal is accomplished in teaching and didactics is scarce (Håkansson & Sundberg, 2012, Persson, 2008, Tallberg Broman in *Pedagogiska magasinet*, 2015, Vallberg Roth & Månsson, 2010). This probably also leads to a lack of professional language that could support a discussion in these areas. If the ideal of children learning from exploring and creating is to be combined with good quality learning in a merging of education and caretaking (cf. OECD, 2006, Tallberg Broman, 2010), then children will have to produce themselves but also learn about new areas, they should be involved in listening to as well as challenging ideas, as is achieved by the preschool teachers planning for a scaffolding environment (cf. Barsotti, 2001, Dahlbeck & Persson, 2010, Mardell, 2001, *Pedagogiska magasinet*, 2016). It ought to be a question of clarifying the

important factors and differences of teaching and its results, rather than dichotomizing what is perceived as preschool activities or not.

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