Curriculum decisions for thinking at preschool level

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Abstract

Preschool is the first stage of the school system. A well-constructed curriculum at this level, including strong implications for children's thinking, affects the results throughout the further school system. In Sweden such a national curriculum was presented in 2018. This paper presentation deals with the effects of implementing the curriculum in one municipality in Sweden. It is part of an on-going evaluation research project. This report is a close-up didactic analysis of some particular teaching situations to shed light on how the teacher acts and the consequences in children's progression. The observations were closely analyzed using Eisner's (1991) educational connoisseurship' and 'educational criticism'.

The result shows that teaching had changed to more structured and knowing pedagogy, when compared with earlier studies and research. The didactic moves were understood by most of the preschool teachers, to a certain extent. How to variate to visualize the learning object in a particular activity, or to motivate the children are areas that could be developed. There was an overrepresentation of preschool time letting the children choose among a limited, and sometimes conform, number of activities, with little or unclear goals, and little or no scaffolding by teachers. Some of the tasks, or at least the way they were handled, were reminiscences of an earlier way of understanding teaching. The curriculum was interpreted through these historical goggles. Many activities gave the impression that children were waiting for something, maybe for maturity to take place. Observations of children working collaboratively, were scarce. However, the teachers were trying to grasp new ways of acting out the concept of 'teaching', even if it sometimes caused confusion. Some exceptions to the common results were also displayed, preschools working in advanced, long sequence projects, with a high degree of children participation and influence.

Introduction

Preschool is the first stage of the school system, making teaching there important. The first national curriculum for preschools in Sweden was presented in 1998, changing the official theoretical basis of preschools towards socio-cultural and socio-cognitive ideas. Traditionally, Swedish preschools had been influenced by Froebel's, and Gesell's maturity development ideas, an influence that had been persistent for almost 200 years.

During the first two decades after the introduction of a preschool curriculum, international comparisons showed that Swedish students were lagging behind in results in reading and mathematics. This led to a series of changes in school curricula; one of the measures taken was a revision of the curriculum for preschools. When assessing preschool teaching, the *Swedish School Inspectorate* (Skolinspektionen, 2016a; 2016b) found that caretaking held high quality, but that the quality was low in teaching. A national curriculum, including strong implications for children's thinking, was introduced in 2018, in order to affect the results throughout the whole school system (*Lpfö 18*). It included stronger references to what kind of teaching should take place in preschools:

> The children must be given the postulates for general education, thinking and knowledge development based on various aspects such as intellectual, linguistic, ethical, practical, sensual and aesthetic.

National curriculum for the preschools, Lpfö 18 p. 10[1].

The on-going evaluation research project (c.f. Brulin et al., 2009), where this paper is the last of three reports, deals with the effects of implementing the curriculum in one municipality in Sweden. The researcher has followed the municipality preschools closely, from the early implementations of new ways to perform and assess teaching, made before the introduction of the new curriculum, to the evaluation of implementation results.

Results from the mid-term study

The municipality introduced an over-all-schools development project called *Education Falkenberg* in 2016 with the aim of developing the students' results. To that end a set of quality indicators was produced and implemented in local preschools in 2017, guiding how the teachers[2] could assess the progression in children's literacy, mathematics and learning identity. The mid-term study (Pihlgren, 2018) was done one year after the implementation and showed that the project had resulted in a more professional terminology among most of the preschool teachers, and a higher awareness of how to assess progression in learning. Teaching basic knowledge and skills had also developed.

However, few teaching activities aimed at analysis and critical thinking, self-assessment, or creative thinking among the children were observed in the teaching. This seemed to be connected to the way the preschool teachers thought about learning – following and studying the child in action rather than focusing on what they should learn – possibly remains of the pre-curricular discourse in Swedish preschools.

The municipality evaluation

Five years after *Education Falkenberg* was launched, an evaluation was initiated by the municipality (Pihlgren, 2022). The observations were performed as *learning walks*, 15-30 minutes observations in 2-4 activities at each of the 15 preschools in the municipality, with a researcher, three of the principals, and 1-2 central administrators as co-observers and co-analyzers each day.

The quality of preschools was found good, especially when it came to caretaking, good relations, and enhancing an including and respectful atmosphere. The preschools had overall developed in line with the national curriculum. All preschools showed attempts of formative documentation, the teachers made references to the quality indicators and often used a professional language. Although the covid-19 pandemics had made a setback in development, the intentions of *Education Falkenberg* seemed to have contributed with supporting structures for development.

Four target areas were in focus in the evaluation[3]: inclusion of all children, every child's positive learning identity, formative teaching, and collaborative learning methods. The result showed that the areas connected to caring were well developed: Inclusion and children's positive identity. The children overall seemed safe, happy, and positive. The conditions postulating a strong learning progression hence were in place, but as the children's learning weren't challenged, learning progression often didn't take place. When learning was observed, the activities often trained already required skills.

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[1] *Läroplan för förskolan, Lpfö 18*: "Barnen ska ges förutsättningar för bildning, tänkande och kunskapsutveckling utifrån olika aspekter såsom intellektuella, språkliga, etiska, praktiska, sinnliga och estetiska".

[2] In Swedish preschools, academically educated preschool teachers work along with trained caretakers and non-trained caretaker assistants. All categories might teach, under the guidance of the preschool teacher. In this text *preschool teacher* or *teacher* is used for all categories, since the focus is on teaching.

[3] The observation form, see appendix A.

When it came to teaching, and formative teaching especially, the results were more irregular. Some preschools showed high teaching quality, others showed attempts to teach and the teachers seemed to test different approaches. At some preschools few attempts to teach were visualized. A lack of goal focus seemed to characterize many of the observed activities, and a lack of professional terminology among staff members when it came to making more accurate definitions of what was going on in the teaching and learning situations.

Collaborative learning was observed on a few occasions. Most of the learning activities were individual – every child managing his or her own material or activity. Interplay was observed but this was not stimulated to enhance collaborative learning. The children and the teachers overall seemed to form a community but they didn't act as a community of collaborative learners. However, in places where teaching encouraged this, the children showed a deeper understanding of the learning objects, both at play and when interacting with others.

The present study

This present study is a close-up didactic analysis of some teaching situations observed during the evaluation. Each observation was chosen because it illustrates a particular, and common, phenomenon in the evaluation results. The situations were closely analyzed to shed light on how the teacher acts and what the consequences are in children's thinking. The results can hence be helpful to unveil the underlying pedagogical understanding, needed to teach for strong learning progression in preschool.

Design

The results of the evaluation, and of the mid-term study, showed that childcare was excellent, and that the teaching concept and the quality indicators were implemented. However, the results also indicated inequivalences between the preschools when it came to teaching and learning. The present close-up study was hence focused on the quality of teaching.

Aim and research questions

The aim of the study is to unveil some of the understandings that a preschool teacher needs in teaching, to enhance progression in children's learning. The results could later be used when educating and coaching the municipality preschool teachers further, as well as preschool teachers at large.

The close-up study is guided by the following questions:

- *What understandings of the concept 'teaching' are visualized in the teacher's activities?*
  - *How could the observed activities be developed to strengthen progression in children's cognition?*

On-going evaluation research

Several research methods allow project participants to be active in evaluation of their ongoing development: On-going evaluation, Action research, Participatory research, and Participatory action research are some. Although different in theoretical backgrounds, common to all these methods is the idea that knowledge is developed through action (Starrin, 2007). A central idea is that projects and research will benefit from systematic cooperation between researcher and the researched. This study is part of an *on-going evaluation:* A project in progress is evaluated and the researcher is able to give feedback to the project group, contribute to systematic learning, generate research-based knowledge, and enlighten more sustainable solutions in practice through knowledge distribution (NUTEK, 2008; Tillväxtverket, 2009). Through critical analysis of the project and by acting as a discussion partner to the project managers, the task of the researcher is to contribute to making the project reach the goals more productively (Brulin et al., 2009). The data analysis is partly done with those concerned in the

project, although the researcher is responsible for the final analysis and conclusions. This means that the researcher also has to be involved in the evaluated project (Ahnberg et al., 2010).

Coding observations and analysis

The observations made for the municipality evaluation were transcribed, sorted, coded, resorted and recoded from four different aspects:

- Manner of teaching (see figure 1)
  - Individually or collaboratively based teaching
  - Clear or unclear teaching goal
- Learning content (see figure 2)

A phenomenological approach to the material was taken during data analysis, where Eisner's (1991) 'educational connoisseurship' and 'educational criticism', were used: By knowing the research area, the researcher can decide what are important features and nuances in the material (connoisseurship). The connoisseurship is combined with a critical approach where results are examined and valued (criticism). The researcher then describes the results in such a way that the recipients can visualize and experience them. The researcher interprets, analyzes and decodes why the results occur and evaluates the value for school development in general, as well as points out themes and dominating features.

Validity and reliability

Around half of the municipality the preschools were part of the evaluations that generated the data material. The overall result contains observations from different preschools and from different activities during a preschool day. This probably makes the result more valid, especially since most of the activities were observed by more than one observer. The analyses have also been discussed with the co-observers to guarantee more reliability.

The principals observed their own preschool. This might affect the reliability. However, there were other co-observers, including the researcher, and many of the participating principals where fairly new at their preschool and hence weren't feeling a strong ownership. However, the new principals might in turn have affected the validity because of lack of connoisseurship, but there were also co-observers with a long experience.

To enhance validity, the project and research were discussed with fellow researchers and developers, and was presented at the 2022-year conference of Teachers' Association, TA, Latvia.

Ethical aspects

Using participatory methods means extra considerations when collecting and analyzing the data (c.f. Ahnberg et al., 2010). This was constantly considered during the process.

The participating preschools were informed about the study and the evaluation. The material has been anonymized when it comes to preschools and names of individuals.

Literature

The National Agency of Education (Skolverket, 2013) states that preschool teaching should be given a wide interpretation where caretaking, development and learning are merged, and where methods include planned activities, as well as learning in everyday situations. According to the curriculum (*Lpfö 18*) teaching should give all children the support and the challenges they need. The Swedish *School Law* (*SFS 2010:800*) constitutes that preschools should strive to offset differences in the children's abilities and conditions.

The curriculum is based on interactive learning theories. Vygotsky (1978) and his research group explains learning as starting collaboratively – the learner learns in interplay with the context and others, and later internalizes what is learned. The child will go from not knowing because of lack of experience (zone out of reach), to understand or do something with support (proximal development zone), to master the understanding, knowledge or skill (present zone of competence). The proximal development zone is where the scaffolding support of the teacher is highly important for the child's intellectual development (Lurija & Judovitj, 1982).

Research has shown that children collaboratingting think more effectively (Billings & Pihlgren, 2009; Williams, 2006). In the group there is always some child that at a certain point understands more and can scaffold the others – the proximal development zones of the individuals overlap and the group get access to a *multiple proximal development zon*e (Brown, 1994; Kumpulainen & Mutanen, 1999).

The current and former context of Swedish preschools

There is a lack of research on teaching in Swedish preschools (Vetenskapsrådet, 2008; Håkansson & Sundberg, 2012). Especially research about what is taught and how is hard to find. Research and evaluations also point at a lack of knowledge in subject matters among preschool teachers (Skolinspektionen 2016a). The teachers tend to focus on children's maturity instead of their learning (Persson, 2008; Williams, et al., 2016). There is also a lack of understanding among the teachers of how to interest all children and how to include them in thinking about what and how they learn (Elfström Pettersson, 2017; Lindroth, 2018). Instead, preschool teachers seem to guide the children with more or less subtle methods to what is desired (Nilfyr, 2018).

This lack of didactic knowledge might be explained by the fairly recent introduction of the teaching concept in preschools. In the interactive theories, proposed by the current curriculum, possibilities for children to interplay and collaborate, to learn, and to be creative are important (cf. Strandberg, 2006), especially because interplay is vital to children's development (Björklid, 2005; Nordin-Hultman, 2011). This presupposes changeable and adaptable materials and contexts, rather than predictable and prefabricated. However, the choice of material was, and often still is, surprisingly conform and limited, mediating what and how children ought to be and do (Eidevald & Wallander, 2016; Persson, 2008).

Billy Ehn's (1983) classic cultural analysis study of *daghem*, daycare centers, predecessors to preschools, showed a fairly conform context, with the same material and room functions, giving a clinical institutional impression (cf. Almqvist, 1994). The staff offered what they consider meaningful activities but when the children protested it caused confusion and hesitation – should the staff teach the children to submit to social rules or let them do as they felt? Ehn concluded that the contextual order was used to foster the children, without the grown-ups having to alter from acting as helpers to the children. He called the study 'Shall we play tiger?' The observed groups of children often played wild animals escaping, and he concluded that they were processing their own situation.

Teaching theories

Three main groups of theories affect practice in today's teaching (Håkansson & Sundberg, 2012, Pihlgren, 2011): the behaviorist, the maturity, and the interactive[4]. The interactive theory (cf. the tradition of Vygotsky, Dewey) and the maturity theory (cf. Fröbel, Gesell, Montessori, Steiner) sees the learner as active, as opposed to the behaviorist view that individuals will learn when influenced

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[4] The praxis theories, as described here, are focused on how educators have interpreted the perspectives in their practice – cognitivism/constructivism is the foundation of maturity theory, and pragmatism and socio-cultural perspective are the foundations of interactive theory.

by external stimuli (cf. Pavlov, Skinner). In the behaviorist tradition, learning and maturing are considered to be the same process (Carlgren, 2011). In the maturity tradition learning is seen as an effect of maturing. In interactive theory, the child will learn and thereby mature and develop.

Depending on how theories are interpreted they either support the teacher's intentions to teach children to think, or not (Pihlgren, 2013, 2016). The most common praxis theory exposed in preschool activities is the maturity tradition. However, teaching interactively leads to progression in thinking among children.

Manners of teaching

Teaching theory, *didactics,* presupposes three chief questions: *Why? What?* and *How?* When planning a teaching activity, the questions will help the teacher to reflect on the aim of what is taught: *Why is this important knowledge to human beings?* They also show the teacher what the teaching content should be: *What should the children learn?* and what will be the best way to get results: *How will I best teach so that all will learn?*

If the aim isn't clear to the teacher, it will not be clear to the children, leading to a lack of motivation (cf. Jensen, 2015). When the goal is unclear to the teacher, it will be hard to assess results in learning, both for the teacher and the child (cf. Jönsson, 2011). If the methods are haphazard the teacher cannot guarantee that all children learn or show an interest (cf. Pihlgren, 2020). Answering the three questions when planning is vital if learning is to take place (Wiggins & McTighe, 2011).

Four different positions are possible when planning, figure 1 (Pihlgren, 2013). The teacher might have a strong intention to reach a certain goal with the activity, a strong product intention. The intention might also be weak, either because the teacher wants to emphasize the process, or because of lack of a certain goal. The didactic *What?* is thus either in focus or not. The teacher also has a strong or weak intention when it comes to the didactic *How?* Either the activities are closely planned, or the teacher chooses not to have the process in focus to enhance children's' skills, or trusting that the context and material presupposes certain actions, or because of lack of understanding of how to guide the learning process.

The didactic consequences are displayed in figure 1: Position A. *Didactic position,* where both product and process are specified, B. *Process oriented position*, where the process but not the product is in focus, C. *Maturity position*, where the outcome is specified but not the process, and D. *Chaotic creative position*, where neither is planned by the teacher. The outcome of the last position might be chaotic, leading to little or not desired learning. It could also be creative, giving children opportunities to experiment and integrate their learning.

Teacher's intention of *what the student learns*, product intention

Strong product intention | Weak product intention

Teacher's intention of *how the student learn*, process intention

Strong process intention / Weak process intention

A. DIDACTIC POSITION	B. PROCESS ORIENTED POSITION
The teacher introduces new knowledge and generalizations	The teacher supports the process but doesn't guide the outcome
C. MATURITY POSITION	D. CHAOTIC/ CREATIVE POSITION
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	The student learns or not on his/her own

Figure 1. Teachers' intention in planning and teaching (cf. Pihlgren, 2013).

Previous research (Pihlgren, 2013; 2016) shows that teachers using all the didactic positions in figure 1, interchanging between planning either the product or the process or both, promoted progression in children's thinking. The children varied focus either to reach a specific goal, explore their own goal, or choose their own method.

According to variance theory (Marton et al., 2004) it is important that the teacher let children see the various parts of a learning content. By changing one factor at a time, keeping the others constant, the children will eventually understand the content. Hence, it is essential to define what particular knowledge or skill is to be developed, the *learning object*. The learning object is a link in a longer chain of activities in progression to reach a certain learning goal (Holmqvist Olander, 2014).

Components of learning
Mortimer Adler (1990) pointed out that didactic activities are formed by different components, all necessary to learning, see figure 2. When acquiring new knowledge, the learner masters something that he or she hasn't been able to do or understand before, the outcome of position A in figure 1. The learner then has to practice and train the acquired skills, the maturity C positions in figure 1. In the third component the learner internalizes the present knowledge by exploring and creating, the process-oriented position B. There is also a need for incubation – resting the brain from hard intellectual and cognitive work by focusing on something else, the outcome of D (Björklund, 2008).

Figure 2. Learning contents (cf. Adler, 1990).

According to the literature review there is a lack of didactic knowledge and understanding among preschool teachers in general. The curriculum proposes interactive teaching but the preschool staff tend to repeat older patterns. However, the scarcity of studies about preschool teaching makes it hard to distinguish the subtilities at work in the teaching situations. This close-up analysis might show more specific traits that could be at help to understand and improve preschool teaching.

Results

This study focuses closely on the teaching and will use the positions in figure 1 as a tool to visualize the results. All didactic positions in figure 1 were found in the data.

Teaching new knowledge, position A

Several observations showed teaching in the didactic position A, where the teacher had planned both the goal and the process closely:

> The children are watching a short movie about experiments, talking to each other and to the teacher during the film. Afterwards, the teacher has prepared bottles filled with water at a table, where they all gather.
> - Do you remember that we made mug-phones the last time? Now we're going to experiment with bottles and water, like they did in the film. Does anyone want to try? Several children answer positively and start blowing into the bottle but have problems getting sounds. They discuss and try to help each other. The teacher shows how they can hit the bottle with a stick or a spoon. The children test and discuss their results.
> - What do you think is happening here? asks the teacher. She once more reminds of the mug-phone and after a while brings more bottles, water and a funnel. The children help each other to distribute the bottles and to pour water in each bottle.
> - Why don't we hit one at a time? Let's first listen to Vivi. One child at a time tests. A child succeeds in blowing a tone in the bottle but the teacher asks him to wait with the blowing.
> - Could anyone explain what is happening? the teacher asks. No? When you blow there are vibrations. The more air there is, the lower the tone will be. She tries to show this by hitting the bottles but since the bottles as well as the sticks are all different sizes, this fails.
> - I don't understand, a child says.
> - I think it's like the megaphone, another child answers.
> The children now pour more water into their bottles and start doing music by blowing, pinging, stomping on the floor, and patting the table.
> *Observation 1[5]. Older children with one teacher exploring sound waves in bottles.*

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[5] The excerpts are translated from Swedish and are formulated in a reader-friendly way.

The goal of the activity is clear, both to teacher and children, they are investigating sound. It is part of a sequence of activities centered around understanding the phenomenon sound waves, as could be derived from the rich documentation of previous experiments on the wall in the room where the activity takes place. The teacher has prepared the process closely: A film to motivate, material and the actions are prepared. However, something doesn't work the way the teacher has anticipated. The children have problems blowing sounds from the bottles, a problem that the teacher solves. But she cannot really create understanding. Using the terminology of variation theory, she has not taken into account that all variables but one has to be left unchanged. If she had used the same bottle (and stick) and poured different amounts of water, the children might have been able to grasp that the pillar of water changes the amount of air in the bottle, thus changing the sound. Maybe a clearer definition of the learning object in this activity would have helped the teacher to see how the process had to be arranged. In all, the teacher's plan has invited the children to be interactive and motivated, and also to take responsibility by easing the moment of confusion at the end by making music together.

Another observation shows a more behavioristic didactic planning:

> The teacher sits on the floor with three children. One child is rolling two dices. The other two are waiting their turn, trying to find things to do in the meantime.
> - What does this add up to? the teacher asks. The child counts the dots on the dice and points at each:
> - One, two, three, four. Four!
> - That's right. Can you take four sticks? The child takes four wooden sticks from a box and puts them on the floor.
> - Can you choose the right digit too? the teacher asks. When the child hesitates, the teacher counts the digits aloud and points at them, they are laying in order: 1, 2, 3…
> - 4, the child fills in and takes the digit four and puts it on the four sticks.
> - And now put the plus sign there, the teacher says. Do you know what it looks like? The child crosses two sticks. Now you can roll once more, the teacher says. The child rolls the dices and counts the dots aloud to five. She takes five sticks and puts them on the floor, counts the digits to find five and put it on top of the sticks.
> - Now there's the equal-to-sign, the teacher says. The child looks questioning at her. Do you know what it looks like? The teacher gives her two sticks. The child crosses them. No, that's a plus, the teacher corrects, this is how it should be. She puts the two sticks parallel. This is where it should say how many sticks there are altogether. Can you count? The child counts to nine sticks and puts nine sticks on the other side of the equal-to-sign. Supported by the teacher, she finds the digit and puts it on top. Now one of the other children is in turn. The procedure is repeated. When this child doesn't know how the addition-sign or the equal-to-sign looks the first child is asked to show.
> *Observation 2. Three five-year-old children with one teacher doing calculations.*

The most striking difference to observation 1 is how the children react to the teaching. Here, they do what the teacher asks them but there is no signs of motivation and no deeper interaction about the learning – the children answer the questions, put by the teacher. Observation 1 shows interactive theories put into practice, while observation 2 shows behavioristic. The goal is to teach the children addition, counting, digits and the two signs. This also seems to be what they learn. However, the process hasn't been planned thoroughly, two children are constantly waiting, and the sticks are used both as objects and as signs, which might confuse the learning outcome. In the end there is actually 22 sticks on the floor, instead of the 9 that the number of dots add up to, see figure 3.
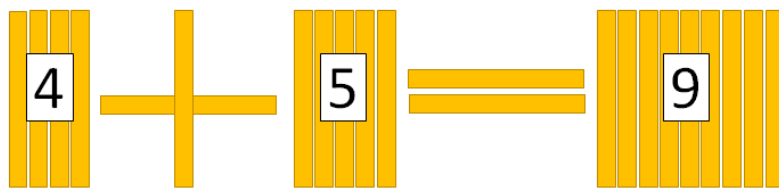
Figure 3. The final display of sticks and digits, showing 22 sticks instead of the real result, 9.

Both the observations show that the teachers know how to plan for learning, and that their teaching is planned to result in new knowledge. But they also show that their teaching skills would profit from further didactic knowledge, something displayed in several of the observations.

Supporting the process, position B

In some of the observations the teachers focused mainly on the process:

> A group of the youngest children and two teachers explore blowing soap bubbles and moving and lifting things, using a hairdryer. They are in a relatively small room. On the wall there is a projection of a piece of ice with frozen bubbles. The children move among the activities and test different ways while the teachers create and change the conditions, as well as denominate what the children are discovering. The children are engaged in the testing. The teachers encourage with questions:
> - Are there any bubbles coming? Shall we try another? A child succeeds with blowing a bubble.
> - Look, there you have a bubble! How did you blow? Test once more!
> - Shall we test this? A child experiences the airflow from the dryer. Shall we blow soft or hard?
> - Look, what happens now? This is too heavy; the air cannot lift it. Can you try a lighter thing? Yes, the ball might work. The conversation continues about why some things lift and some don't and the children are responding through sounds and gestures. They also go to get more things to test with.
> *Observation 3. A group of one- to two-year old children and two teachers exploring air.*

There is a direction – exploring air and how it works – but there is no specific goal or learning object for this particular activity. Instead, focus lies on the exploration and discovery itself. The teachers actively point at what happens, as well as encourage further exploration, with open-ended questions as chief working tool. However, using open-ended questions don't always lead to a better understanding or learning, as in this sequence:

> Two boys are cooperating, trying to lay a roof of cardboard on a scaffold, higher than themselves.
> - Hold this here.
> - It's not long enough, it's too short.
> - Could we take one more? They try with one more cardboard but have problems holding it up.
> - Maybe with this? One of them tries a cloth but then the cardboard sags.
> - It has to work! one of them exclaims. They continue trying to find solutions while discussing.
> A teacher enters and starts posing questions to the boys:
> - What are you doing? How many are up there? What is your thought with that? Are you building a roof? The boys ignore her, and continue to build in silence. Another child enters and looks at the builders. The teacher turns to her and says:
> - Do you know what help Håkan needs? With fixing the roof! The child steps closer but says she doesn't want to join.
> *Observation 4. Two five-year-old children building, a teacher asking questions and a five-year-old looking on.*

The boys are ignoring the teacher's questions, maybe because they seem out of place, even though some are open-ended. As a result, the boys' problem-solving dialogue is silenced. Teachers' involuntarily interrupting an ongoing collaborative dialogue among children was observed on some other occasions.

In the third observation the teachers use the open-ended questioning with a specific teaching purpose – to support the children's exploration. In the fourth observation the open-ended questions more or less seem to be a way to show friendliness, as when the teacher invites the third child to participate in the building project of the other two children. The teacher seems uncertain if this is one of the situations where learning should be captured in flight and how she ought to act. This uncertainty in situations where children play is displayed several times, like in this observation where the teacher suddenly interrupts a boy in play with an out-of-context question:

> A boy is driving little cars into a garage, talking to himself about what he is doing:
> - This goes all the way up, it's very quick!
> The teacher, seated beside him leans forward and asks:
> - What color is that car? The boy looks surprised at her and then answers:
> - Green.
> - Yes, that's right, it's green.
> *Observation 5. A three-year-old child parking cars, and, a teacher asking a question.*

Her intention is presumably to train color-recognition but the boy is interrupted in his play, and he already knows the color. However, there were examples when learning actually was captured in the moment, as in this sequence, where the teacher takes the opportunity to play with a girl:

> - Is this the mother or the sister? The teacher points at a human figure that the child has chosen from a box.
> - Da mom, the child answers.
> - Are there any more in this family?
> - Dad, bro, girl, the child answers and picks some figures from the box.
> - Oh, a dad, a brother and a sister. Where do they live? The child points towards the city that has been built in the preschool project. In the city? the teacher confirms. Where there – show me!
> The child and the teacher move to the city.
> - Tha live, the child says and points to a house she has made earlier. Shop!
> - Are they going to the shop? Will all come?
> - No, on'y child'n. The child takes the two smaller figures and "walk" the to the candy store.
> - Aha, so this is where they are going to shop, I see. What are they shopping in the candy store?
> - Candy!
> *Observation 6. A four-year-old child playing with a teacher.*

The group is somewhat smaller this day and one of the teachers take the opportunity of playing with a child and at the same time training her Swedish language skills.

Children choose the process, position C

In a lot of the observations the children choose what process to take part in:

> While the inner rooms are being cleaned the group are in the larger play hall. Some boys are building in a corner with building gear. Some girls color printed coloring-book pictures with pencils at a table with a teacher. A mixed group are beading pegboards at another table with a teacher. One of the girls counts silently how many beads she needs.
> - I'd like 12 yellow, she says to the teacher, who counts the beads into the girl's hand.
> - What is this? another child asks. The teacher explains and shows a picture on her phone.
> - I'll take yellow, a child says, turning to another child.
> - I will too. I like pink to most; I'll have it on that.
> - Pink is what my sister likes.
> - How's it going Nils? the teacher asks a boy.
> - Good, I'm ready soon.
> The conversation at this table continues, while the building boys have started to roam the room, aimlessly as it seems.
> - Brown is now opened but you have to clean up before you enter, a teacher exclaims.

The children and teachers start moving towards the inner rooms, some of the boys to the building corner, some girls and a boy to play board games with the teachers. A male teacher joins the building corner. The boys turn to him with interest.
- I'm building a car, look.
- Oh, that's a nice one, the teacher answers.
- Mine is a wheel loader, but I can't find that thing. He points at his building object.
- Okey, the teacher answers.
Observation 7. Older children choosing various activities with three teachers.

The children here choose their activities and are free to move between them. However, that doesn't mean there is a free choice. A lot of the observations show that some activities are recurrent in many preschools: beading pegboards, coloring printed color-book pictures, building and playing with cars, playing boardgames, are the most common. Other activities are scarce in the observations: reading aloud is only observed once, as well as planned language activities, and several of the preschools offers no human figures or materials connected to home life to play with.

The learning content of the activities is at most training children's skills, at their present zone of development, what they already know. Sometimes it is obvious that the children already masters what is trained:

– What color is this? The teacher asks one of the children and points at the dice.
– Blue! the child answers.
– Do you have a blue? The child points at her board.
- Sure, that's blue! Who's next?
Observation 8. A group of three-year-old children and a teacher playing a board game.

This kind of activities is in fact constituting a large amount of the preschool day in most of the preschools. The goals of the activities are often hard to disclose, even to the experienced eyes of the observers. In observation 7, the goal turns out to be waiting for the ordinary rooms to be cleaned (department brown), but waiting for something else – lunch, going out, the parents – seem to be the outcome of most of these activities. The activities thereby function as pastime, rather than learning occasions. Two short observations might suggest that this lack of meaning in the activities also occasionally is felt by the children:

- What are we going to use this for? a child asks in the middle of an activity of cutting and pasting. The teacher sits quiet for a while and then answers:
- I don't know.
Observation 9. A group of four-year-old children and a teacher cutting and pasting.

A group of children are coloring color-book pictures of easter-eggs with pencils. The eggs are large, and cover most of the page. A girl has colored the tip of a star on the egg and a little of the left corner of the egg. Now she is sitting with her hands in her knee. A teacher sits down at the table.
- What nice stars, she comments, pointing at another child's drawing. The first girl glances shortly at the commented picture and then takes up a pen and studies it closely.
Observation 10. A group of four-year-old children colors color-book pictures and a teacher commenting.

In observation 9 the child seems to put into words what several of the observers commented on: What is the goal? In observation 10 the child seems to have given up on a seemingly hopeless project – she will never be able to color the egg with the meticulous accuracy that she anticipates, the pencils will not cover the area well enough. Sometimes it is possible to detect that children's' actions are done in protest to the organized activities:

A boy and a girl are building alone in the building room, while the rest of the group are painting in another area. They have built guns and are now shooting at each other while they run around.
- Why are you here, the observer asks.

- 'Cause we have escaped. We're building with guns and shooting.
Observation 11. Two children playing with guns and an observer ask a question.

However, most of the time children participate in these pastime activities, sometimes with interest and joy, and other times at least without complaining.

In observation 7 another common phenomenon is visualized. Often when a teacher is present the conversation passes between teacher and an individual child, as is showed in figure 4, displaying the contacts at the table of beading pegboards in observation 7. Contact between children is only taken once and the two children sitting further away from the teacher are not part of any conversation.
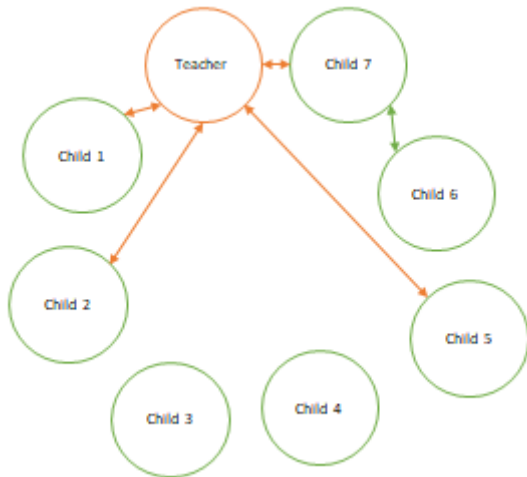
Figure 4. Communication at the table beading pegboards.

This also displays another consistent feature in the observations: All activities observed show teaching on an individual level. Almost no collaborative activities were executed, where children work together to solve problems or to learn. The teacher takes on one child at a time, in conversation but also in teaching, like in observation 2. Each child handles its own material, sometimes conversing with others, but seldom collaborating to understand something better.

However, a few preschools differ from the common picture. Here, the days seem to consist of two kinds of teaching activities: Sequences of teaching, connected to longer thematic projects, where the children are challenged to explore new knowledge, and a time during the day where the children make choices of activities from a planning board, where the activities have been discussed and chosen together with the children. As opposed to a lot of the other preschools, where documentation could be considered being of a 'display window character' showing visitors what was being done at the preschool, these preschools used the documentation formatively, to show the children on the group's progression in learning.

Chaos or creativity, position D

The last position D in figure 1 occurred from time to time in the observations, sometimes when play was encouraged to enhance learning:

> The documentation is placed in the children's height on the wall and shows that the group is working with a children's book. The activities and the children's questions, ideas and discoveries over time are made visible. In the room the important contexts from the book have been reconstructed. The book is also displayed, and pages from the book has been plastered to the floor. Little figures from the books and of the children have been cut out and can be moved in copies of the book context. When the group of observers arrive, the children immediately invite them to play – some are invited to eat at the table,

others to travel in the truck. When it's time to go to lunch the children decide to gather at truck bed, built for the project, instead of on the carpet as usual.
Observation 12. A group of one-two-year-old children with three teachers and observers playing.

The children here seemed to own the project but it is the thorough planning of the teachers that allow them to be able to explore and understand the content further through play, even though the particular moment observed wasn't planned by the teachers. In some observations, the lack of planning led to more or less chaotic or at least uncertain contexts:

In the small building room, four boys are playing. Outside, in the larger room, a teacher sits at a table with two children who puzzles. At another table a teacher and three children are playing a board game. A third teacher stops by the entrance to the building room and asks:
- What are you really doing in there? and then she walks on. After a while one of the sitting teachers rises and glances in at the boys but soon returns to her table.
- You can't have that, one of the boys says, pushing one of the others.
- He can so! You can't decide! says the boy who wasn't pushed. One of the children seated at the table rises and shuts the door to the building room. Through the door window one of the observers sees a boy blubbing at another and one boy holding a piece of lego so that the others can't reach it.
Observation 13. A group of four-year-old children and three teachers interacting in and around the building room.

Several observations of the same kind were registered. The building corner is most often in a small room, almost always solely occupied by boys, and in almost all observations without a teacher. Observation 7 is an exception, here a male teacher sits down with the boys, but without initiating any real interaction or collaboration. The observations also show that the majority of female teachers tend to sit at tables, interacting with the girls and some of the boys who chooses activities like beading, coloring, cutting and pasting, doing puzzles, and playing board games.

In a few cases the quality differences are striking – at different preschools the same activity could be used or not used to teach or train a child, as these two observations of diaper-changing shows:

Through the half-open door, the observer sees a teacher changing diapers, interplaying with the child in another language, counting toes and fingers.
Observation 14. A younger child and a teacher, changing diapers.

- Hi, hi, a boy says and looks into the diaper-room where a teacher is changing another child's diapers.
- Hi, hi, the teacher answers, closes the door somewhat and quietly continues changing.
Outside, one teacher quietly sits on a chair, looking at some of the children, another teacher and a child play with a ball. The documentation on the wall shows some activities, but these are too high up to be seen by the children. The diaper-changing teacher takes the child out into the big room and collects the next child to be changed on.
Observation 15. Younger children with three teachers, one changing diapers.

In observation 14 the teacher uses the every-day opportunity of one-to-one interaction to train and enhance the child's language, in observation 15 there's no teaching. The over-all impression in this observation is a lack of understanding among the staff of what teaching is, and how to make sense of what they are supposed to do, like how to use the documentation. However, this was a single observation, not representative to what was seen in the rest of the material.

Summary of results

With very few exceptions the preschool teachers seem to master the essential ingrediencies in teaching for new knowledge, like planning and organizing activities. To many this is organized in an interactive way, but some seem to fall into earlier traditions. More advanced didactic knowledge – organizing for group learning and interaction, and planning with a clear learning object – seems to lack in most preschools. Many preschool teachers have problem distinguishing how and when to

support children during the process. There is an awareness of the importance of dialogue but not enough understanding of how to listen to what the children think and to pose follow-up questions to enhance progress in thinking. A lot of the preschool day, with a few exceptions, is devoted to children choosing between relatively predictable and recurrent activities, where a learning goal is hard to detect, at most training of skills. The outcome is often pastime while waiting for something. In these preschools the teacher role seems to be to create friendliness and organize activities. An exception from this is the building room, where the children, mostly boys seem to set their own agendas. Some preschools show a productive alternative to this common preschool context. The preschool teachers there seem to organize thematic projects that cover all the positions in figure 1. The project education is alternated with open choices of activities, communicated with the children.

Conclusions

The positions possible in teaching, figure 1, interact to create strong learning (Pihlgren, 2013): Didactic position A will give children new knowledge (cf. Adler, figure 2), process position B will let children explore, experiment, and create, whereas maturity position C will train skills. Favorizing one position in teaching will not lead to sustainable learning (Pihlgren, 2016).

The research question: *What understandings of the concept 'teaching' are visualized in the teacher's activities?* is answered by looking at how teaching is performed. As the results show, teaching has changed to more structured and knowing pedagogy, when compared with earlier studies and research (Pihlgren, 2018; Vetenskapsrådet, 2008; Håkansson & Sundberg, 2012). The four didactic positions in figure 1 are understood by most of the preschool teachers, to a certain extent (cf. Pihlgren, 2022).

Understanding how new knowledge is taught

The didactic position A is understood as an activity planned on beforehand by the teacher. However, how to plan the process closely is not entirely understood, e.g. how to variate to visualize the learning object in a particular activity (Marton et al., 2004; Holmqvist Olander, 2014) (o1[6]), or to motivate the children (o2) (Jensen, 2015; Pihlgren, 2020). Teaching for new knowledge is understood as *what* should be learnt, but weaker when it comes to *how* this should come about.

The answer to the second research question *How could the observed activities be developed to strengthen progression in children's cognition?* to this extent is strengthening the didactic knowledge of how to plan close-up activities for learning progression (cf. Adler, 1990; Wiggins & McTighe, 2011). A further focus on the teachers' subject knowledge in certain areas as language, mathematics, and science also would strengthen this teaching (cf. Skolinspektionen 2016a).

Understanding how skills are trained

The results show an overrepresentation of preschool time in the maturity position C. Here, the staff seems to be familiar with the procedures, most likely because this position is frequently used in maturity theory education (o5, o7, o8, o9, o10) (Håkansson & Sundberg, 2012; Persson, 2008; Pihlgren, 2011; 2016; Williams, et al., 2016). The maturity position alone gives the teacher few possibilities to affect what is learnt (Carlgren, 2011). In fact, the teacher will be left with controlling the material and the context so that learning, or rather maturing, takes place.

This might explain why the observers, and sometimes the children (o9, o10), found these activities conform and limited. There seemed to be a lack of goals to what skills were supposed to be trained, making learning less assessable (Jönsson, 2011), and often leaving the children with tasks that they already mastered, instead of tasks meeting their proximal development zone (o5, o7, o8) (Vygotsky,

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[6] Examples from the observation excerpts are marked with an o and the number of the excerpt.

1978). Some of the tasks, or at least the way they were handled, are historical reminiscences of an earlier way of understanding teaching (c.f. Almqvist, 1994; Ehn, 1983; Eidevald & Wallander, 2016; Persson, 2008).

Further advance, related to this position, is to strengthen the preschool teachers' understanding of how skills are trained when using coaching teaching style (cf. Adler, 1990). A thorough revision of what materials and activities children meet in preschool, and why, would probably benefit this understanding. This also goes for how the rooms are used. If the building activities should promote for example engineering, they would benefit from taking place in a bigger room with a teacher to coach collaborative problem solving (o7, o11, o13), whereas the air experiment in o3 works very good in the small, delimited room.

Understanding of how to promote exploration, thinking, and creativity

According to research the kind of teaching suggested in position B is essential to make learning sustainable (Björklid, 2005; Nordin-Hultman, 2011; Strandberg, 2006). The teacher's actions will work as an essential scaffold to the child. By posing questions, creating possibilities to explore, and listening to how the child responds to find what is possible for the child to learn within the proximal development zone, the teacher will design the process continuously (Adler, 1990; Lurija & Judovitj, 1982).

An important understanding is that learning starts as an interactive process, and that children learn better when collaborating (Billings & Pihlgren, 2009; Brown, 1994; Kumpulainen & Mutanen, 1999; Vygotsky, 1978). This understanding was lacking among preschool teachers; the children interplayed but they were not scaffolded to work collaboratively (o2, o7). Without showing children how to collaborate to learn they may be in doubt as to why they are collectively organized in preschool.

The results disclose another phenomenon: Many activities seemed to be done in waiting for something (7, o8, o9, o10). The feeling of waiting constitutes a sense of helplessness, being out of control, partly connected to what Ehn (1983) found in the daycare centers, where the staff controlled the children by acting as helpers, and simultaneously constituting the order (o4). An explanation might be the persistent theory – waiting to mature. In preschools where the planning also included activities in the process position, the children were active in learning and in decision-making (o1, o6, o12).

Position B by far seemed to be the hardest to grasp for the observed teachers. In some of the observations, the teacher tentatively tried to seek ways to understand how to act, risking to end up mediating what and how the children ought to be, think, and do (o13) (cf. Elfström Pettersson, 2017; Lindroth, 2018; Nilfyr, 2018). This might explain the insecurity when posing open-ended questions – the teachers are trying to grasp new ways of acting (o4, o8). Not only is the position far from the traditional way of seeing and acting out preschool teaching (maturity position C), it is also far from the guided teaching according to position A.

A closer coaching of the teachers in action is probably necessary to support their attempts to understand how to act and plan for scaffolding – filming and analyzing sections of activities, discussing cases, and coaching in actions. Other methods are defining role models, and creating models for how to plan for collaborative learning and child agency.

Understanding what not to plan

Some of the observations showed how creative playing was integrated into longer sequences of teaching, or caught in everyday situations, using all the positions (o6, o12). But observations also revealed how material and activities, planned to be used in one way, were used for other purposes

by the children, (o11, o13). The building rooms at many preschools seems to function as habitats, mostly for boys who, like the 'lost boys' in *Peter Pan*, played power games, included or excluded, without the presence of grown-ups, and risking to miss out on the learning that school law and curriculum prescribe (Lpfö 18; SFS 2010:800). This phenomenon is connected to the flaws in understanding teaching, already accounted for. A higher understanding of how to plan and execute teaching, using all the positions in figure 1, would also make visible how children-initiated play may enhance learning (o12).

Another reason is the want of common terminology when it comes to discussing and analyzing teaching. There seems to be a confusion in how to interpret how caretaking, development and learning should be merged, and how teaching could be integrated into everyday situations (o14, o15) (Skolverket, 2013). The teachers seemed in doubt of what is teaching and not (o4, o5). This will also make it difficult to define when the necessary incubation to integrate learning is taking place (Björklund, 2008). The teachers would analyze teaching better when able to define what actions are taken to implement new knowledge, train skills, scaffold exploring and creativity, or initiate incubation by letting children do other things or by resting.

Implications for curriculum decisions

When the Swedish preschool curriculum was revised in 2018, the intention was to strengthen children's thinking and learning progression, also the intention of *Education Falkenberg*. The results implicate some areas to consider when making curricular decisions, both on a national and on a local level: The curricular text will inevitably be interpreted through the goggles of the former way of understanding teaching and learning. This makes close-up evaluation on what is currently understood, and what is not yet grasped, essential to coach further development.

At the present point of development, the preschool teachers in the study have already reached important understanding, thanks to close implementation done by the municipality. With one exception (o15) the quality is high. Suggestions for future development are:

- Strengthen the knowledge of preschool teachers in
  - didactic process planning and execution
  - subject knowledge
  - skill training
- Revise the goals and uses of materials, contexts, and activities towards a contemporary pedagogy
- Implement a terminology for describing didactic actions

Figure 5. Page from the children's book 'Didi and Gogo waits for the bus' by Anna Höglund, translation A.S. Pihlgren.

Further research

The perceived waiting for something during many observed activities raised an interest, not only because it connects to the classic play by Samuel Beckett "Waiting for Godot", in figure 5 meritoriously reproduced in a book for children. The phenomenon awoke the interest for exploring how the children perceive preschool, a "Shall we play tiger?" revisited cultural analysis.

Further research could also be a close examination of how scaffolding preschool teachers work.

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Appendix A. Observation form in the municipality evaluation.

Formative teaching

Indicator
The teacher creates a climate that is characterized by an awareness of and about learning so that children / students are engaged and own their learning.
Together with the children / students, the teacher concretizes the learning objectives and what learning the teaching aims at.
The teacher organizes the teaching so that children / students continuously during the learning process receive forward-looking feedback on their learning.
The teacher finds out where the children / students are in relation to the learning objective and designs the teaching based on the children / students' learning needs.
The teaching is characterized by discussions, activities and tasks that develop and make learning visible.

Including teaching

Indicator
The teacher is curious, assesses children / students' knowledge and learning needs and uses different methods to meet children / students.
Based on their capacities, the children / students are involved and have a great influence on the content of the teaching.
The teaching challenges all children / students cognitively.
The teacher uses a low-affective, conflict prevention approach.
The teaching benefits the childrens' / students' creativity and includes opportunities to be productive, create something of their own in learning and express themselves.

Collaborative learning

Indicator
The teacher organizes learning processes so that children / students have access to a variety of questions, thoughts and solutions from other children / students.
Children / students are learning resources to each other.
The children / students show mutual dependence in the groups where all children / students need each other.
The children / students collaborate and communicate spontaneously with others to learn.
The teaching is dialogue-based where the conversation is learning, creates influence and participation and is conducted with respect for others.

Learning identity

Indicator
The children / students show great confidence in their ability to learn.
The children / students work persistently, carefully and independently.
The children / students explore new areas themselves by experimenting, identifying questions, and trying out new solutions, reflect on and analyze different ways of solving problems.
The teacher helps the children / students to focus on the process, rather than on the product.
The children / students dare to ask questions.
The children / students show that they can both give and receive feedback.
The conversational climate provides room for intellectual challenge.